

**A Bibliography of  
Australian Engineering History and Heritage,  
Prepared from the Database 'ENGINE'**

Compiled by

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for the National Committee on Engineering Heritage  
of the Institution of Engineers, Australia

October 1991

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## INTRODUCTION

The first Committee for Engineering Heritage within the Institution of Engineers, Australia was formed in the South Australian Division in 1974, and a National Panel was formed in 1977, to represent and coordinate the work of those division committees which had by then been formed, and to supervise and initiate work on a national basis. This National Panel, with its title changed to that of a National Committee in 1990, has organised five national conferences on engineering heritage, in Brisbane (1982), Melbourne (1985), Adelaide (1986), Sydney (1988), and in Perth (1990). In addition many papers, several sponsored by other committees, have been presented to other conferences, often in response to the sesqui-centenaries of the individual states and to the Australian bi-centenary of 1988.

This bibliography is confined to papers and articles which have been indexed in the database ENGINE, an Australian Engineering Database which has provided references to the publications of the Institution of Engineers, Australia since 1980. It has been prepared as an indication of the work of Engineers within their own professional institution. Further details of the database are contained in the following pages. The net has been thrown widely, in the knowledge that users can reject what is offered more easily than they can search for that which has been omitted. Papers on identifying, assessing, interpreting and conserving items of engineering heritage, which are considered to include but are not restricted to, sites, objects, drawings, documents, reports and other memorabilia, have been included, as well as biographies of Engineers, and histories of their works and of the development of their ideas.

It was prepared as part of a response to an enquiry by the Newcomen Society for the History of Engineering and Technology with headquarters in London, which was itself corresponding with the Society for the History of Technology in the United States, and the Science Museum in Kensington.

It is offered to Engineers as a measure of their work, and to Historians, particularly to historians of technology and to those concerned with 'Australian Studies' and 'The World at Work', as a source to improve understanding of the role of Technologists including Engineers, in the development of Australia. The concepts of a clever country, value added products, and sunrise industries cannot be discussed effectively, without a knowledge of the history which is described sometimes at first hand, in the papers included. Other papers discuss the conservation of heritage, which is necessary for the development of a satisfactory and realistic national identity and consensus.

The index has been prepared in two parts. The first is a general index which contains references to every paper, and is preceded by a list of names of those persons who form the principal subject of a paper. The second part indicates those papers which are of particular relevance to those who specialise in the fields of conservation of artefacts, and in the conservation of sites and structures. Items have been indexed primarily under generic headings, viz archives, bridges, mines, railways, structures, etc. to draw attention to the themes covered. For example Pyrmont bridge is indexed under bridge, Pyrmont. The papers are listed in chronological order with the latest entry first. They are indexed using the database document number.

At the time of searching the database (October 1991), ENGINE contained some 18 000 records and was growing by about 2 000 records each year. ENGINE does not include references to papers published by the Institution prior to 1980 and gives little attention to work done outside the Institution. This may possibly be addressed in future editions.

Users of this bibliography should also consult the databases 'ROAD', 'WATER', 'STREAMLINE', and 'HERA', which identify many other valuable documents.

# ENGINE - AUSTRALIAN ENGINE

## Coverage

ENGINE: Australian Engineering Database provides references to the publications of the Institution of Engineers, Australia since 1980. It also covers some publications of the Australian Institute of Refrigeration, Air Conditioning and Heating and the Concrete Institute of Australia. ENGINE covers all engineering disciplines.

## Information Provider

Information Resource Centre  
The Institution of Engineers, Australia

## Sample record

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Document number	DN
Publication date	DATE
Update month	UPDATE
Document type	DOCTYPE

## Paragraphs

Title	TI
Author(s)	AU
Author location	AULOC
External sponsors	SPONSORS
Bibliographic reference	SOURCE

Imprint	IMPRINT
Collation	COLLATION
Series title	SERIES

Abstract	AB
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Descriptors	DE
Minor descriptors	MINOR

Identifiers	ID
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Document availability	AVAIL
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The compilers of this bibliography, wish to thank Schaunnette Quinn, Manager of the Information Resource Centre at National Headquarters in Canberra, for her assistance and advice.

This bibliography is available in two forms:

1. As a printed document (74 pages), and
2. With the text available in ASCII format on a 5.25 or 3.5 inch floppy disk suitable for IBM or Macintosh compatible machines and capable of being interrogated by word processing packages, with only the introduction and the index as a printed document. Included on the disk is a 'shareware' DOS file viewing and browsing utility.

Details are available from Division Offices of the Institution in each state, or from the Information Resource Centre, The Institution of Engineers, Australia, Engineering House, 11 National Circuit, Barton ACT 2600.



SERIES AB National Conference Publication (IEAust) no 90/16  
The City of Newcastle experienced an earthquake of intensity MM8 on the modified Mercalli Index on 20 December 1989. Damage to buildings and structures, including many of heritage significance, varied from cosmetic cracking, to significant displacement and collapse of major building elements. Subsequent examination of heritage structures confirmed that initial damage was predominately confined to masonry elements which were inadequately connected to each other and to building elements. Of particular concern was the condition of the cavity ties in buildings built prior to the last war, most of which were quite ineffective. Standard methods and details were prepared both for connecting the various building elements together, as well as for securing individual masonry attachments. These incorporate relatively simple trades techniques, and are now being used in reconstruction and repair work in the area. Of particular initial concern was the poor public image created by some engineers who carried out structural assessments of damaged heritage buildings without having an adequate knowledge of, and experience in the conservation of such structures. This led to the premature demolition, in part or whole, of heritage buildings which might otherwise have been saved. A clear case has been made for increasing the awareness of not only the profession but also the relevant authorities that, in the event of a similar disaster, engineers and others experienced in the relevant conservation field, should direct those who have the technical expertise but lack this specific knowledge.

DE MINOR EARTHQUAKES - Newcastle; BUILDINGS - conservation  
BUILDINGS - structural design; BUILDINGS - structural analysis; BUILDINGS - brick; BUILDINGS - repair; STRUCTURAL DESIGN - earthquake resistance; STRUCTURAL DESIGN - failure; MASONRY MATERIALS - cracking; GEOLOGY; SEISMIC WAVES - analysis; CHURCHES; HOTELS; HOUSES; CIVIL ENGINEERING - professional aspects

ID MASONRY REPAIR; ETHICS; SITE FACTORS; BUILDING STANDARDS; POST- EARTHQUAKE PERIOD; CHRIST CHURCH CATHEDRAL; KENT HOTEL; BEAUMONT STREET; HAMILTON; TERRACE HOUSES; CAVITY TIE FAILURE; LATERAL STRENGTHENING; BUILDING ATTACHMENTS; BURRA CHARTER

000000911091  
TI The Golden Mount - Central Queensland's first triumph  
AU GISTITAN=C; BOYLE=RF  
AULOC University College of Central Queensland  
SOURCE Fifth national conference on engineering heritage 1990: Perth 3-5 December 1990: preprints of papers. p99-103  
IMPRINT Barton: IEAust, 1990  
COLLATION 5p 37 refs  
SERIES National Conference Publication (IEAust) no 90/16  
AB Discovered in 1882 after being rejected by miners as a worthless hill of ironstone, the Mount Morgan Gold Mine generated enormous dividends for its original shareholders; it funded the exploration for oil in the Persian Gulf which gave the British navy a strategic advantage in World War One and resulted in the founding of British Petroleum. It led the world in gold treatment technology at the end of the 19th century,

and the Walter and Eliza Hall Trust was founded on a legacy from one of the original investors. After operating almost continuously for 108 years, Mount Morgan Mine will leave few substantial structures behind in the town to show it ever existed. Fortunately over most of its 108 years, there was a continuing commitment of a few staff to the preservation of archival material. This commitment has ensured that the Mine has left behind a wealth of material which continues to provide research resources for those tracing the Mine's technical and social contribution to Central Queensland and to Australia. In 1986, as a result of the efforts of one of these staff and the generosity of the then Chief Executive of Peko-Wallsend, the Company donated all its archival material to the Central Queensland Collection of the Capricornia Institute of Advanced Education (now the University College of Central Queensland) at Rockhampton, for preservation in the College Library. The paper briefly outlines the history of the mine, its links with the technological, education and industrial developments in Central Queensland, and its contribution to the economy of Australia. The written and pictorial records now retained, and the background of some of the people who prepared the material and who assisted in its preservation are described. The present preservation, display and use of the collection, and its significance in research are discussed.

DE MINOR GOLD MINES AND MINING - Queensland  
TECHNOLOGY - economic and sociological effects; INDUSTRIAL ECONOMICS; ENGINEERING EDUCATION; ENGINEERING RESEARCH; MINING ENGINEERING - professional aspects; MINING ENGINEERING - social aspects; INFORMATION DISSEMINATION - technical writing; ENGINEERING WRITING - conservation; PHOTOGRAPHY; MAPS AND MAPPING

ID ROCKHAMPTON; MOUNT MORGAN GOLD MINING COMPANY LTD; ARTEFACTS; PEKO WALLSEND LTD; CAPRICORNIA COLLECTION; NEGATIVES; PLANS

000000911090  
TI The SS Xantho engine: a unique engineering relic  
AU McCARTHY=M  
AULOC Western Australian Maritime Museum  
SOURCE Fifth national conference on engineering heritage 1990: Perth 3-5 December 1990: preprints of papers. p95-98  
IMPRINT Barton: IEAust, 1990  
COLLATION 4p 23 refs  
SERIES National Conference Publication (IEAust) no 90/16  
AB A Horizontal Trunk Engine built by the London Marine Engineers, John Penn and Son in 1861, was recovered by the WA Maritime Museum in 1985, after 114 years in the wreck of the SS Xantho, Western Australia's first coastal steamer. The engine is remarkably well preserved despite its years in a very hostile marine environment, and it has proved to be a significant piece of marine engineering. It is a relic of the Crimean War era, the first mass produced marine engine made, the first to which high pressure steam was applied at sea, and the first 'high' revolution engine applied to the marine environment. Unchanged by human hand since it was lost in the wreck of the SS Xantho in 1982, the engine is a unique artefact, and represents a rare opportunity to study a very significant piece of engineering history. As the propulsion unit from Western Australia's first coastal steamer, and a link to its owner

Charles Edward Broadhurst a remarkable 19th Century entrepreneur, the engine is of considerable local significance and interest. This paper examines some of the relevant issues related to the engine and its recovery and is allied to that of Dr Ian MacLeod who is responsible for the conservation of the artefact.

DE MINOR STEAM ENGINES - conservation  
STEAMSHIPS - Western Australia; STEAM ENGINES - recovery; STEAM ENGINES - corrosion; STEAM ENGINES - cleaning; MARINE ENGINEERING - professional aspects; MARINE ENGINEERING - social aspects

ID MARINE ARCHEOLOGY; SHIPWRECKS; PENNSYLVANIA ENGINE; LIFTING; PRE-DISTURBANCE BIOLOGICAL AND ELECTROCHEMICAL SURVEILLANCE; CAUSTIC SODA BATH; ELECTROLYSIS  
BROADHURST=CE

000000911089  
TI Western Australian marine engineering: its history and preservation: a case study of the West Hoist marine engine restoration  
AU RICHARDS=RW; RICHARDS=VL; MAY=SR  
AULOC Western Australian Maritime Museum  
SOURCE Fifth national conference on engineering heritage 1990: Perth 3-5 December 1990: preprints of papers. p89-98  
IMPRINT Barton: IEAust, 1990  
COLLATION 6p 20 refs  
SERIES National Conference Publication (IEAust) no 90/16  
AB Marine engine design and development began in Western Australia by enterprising people adapting commercial models of motorbike engines, modifying outboard motors to inboard motors, and improving existing marine engines. One of Western Australia's first pioneers was Ingvald (Tommy) Overgaard who made inboard marine engines which he sold under the brand name West Ho. After opening his own engineering business in 1933, he replaced cylinders of Evinrude outboards, adapted defunct Harley Davidson motorbike engines to inboard marine engines, and then manufactured single and later twin cylinder West Ho engines. The West Ho which was restored, is a twin cylinder two stroke petrol engine which develops 8 hp at 1500 rpm. It was made in 1958 in the latter part of Overgaard's career. This engine was conserved and restored to working order, because it is considered an important part of Western Australian maritime engineering heritage. Another primary reason for restoration was to reduce the corrosion processes usually associated with long term storage of engines. The choice of techniques employed were important so that the original integrity of the artefact was preserved. Hence the chemical conservation regimes were organized to suit this purpose, and to develop professional standards for museums. In the absence of any published guidelines for the long term preservation of historical engines for museums, this paper addresses some of the existing problems. The completion of the West Ho engine restoration marks the initial steps in the continued success of the historic engine conservation program.

DE MARINE ENGINEERING - Western Australia; MARINE ENGINES - conservation  
MINOR MARINE ENGINES - corrosion; MARINE ENGINES - repair; MARINE ENGINES - maintenance; MARINE ENGINES - cleaning; COPPER AND ALLOYS - corrosion; CAST IRON - corrosion; CORROSION - removal; MUSEUMS - Western Australia



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MINOR

ID HISTORY; MOVABLE SPAN BRIDGE; TOWER  
STRUCTURE: ROLLER COUNTERWEIGHTS

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AULOC  
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MINOR



corrosion; STEAM ENGINES - corrosion; STEAM ENGINES - conservation; IRON AND STEEL ANALYSIS; IRON AND STEEL METALLURGY; IRON AND ALLOYS - electrochemistry  
ID IN-SITU STABILIZATION; PORT GREGORY; ELECTROCHEMICAL ENVIRONMENT; SACRIFICIAL ANODES; WATER MOVEMENT; CAST IRON; WROUGHT IRON; SERPULID WORM TUBES; MARINE BIOLOGY; SCREW DRIVEN VESSEL; PENN & SON ENGINE

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TI The rejuvenation of weak earthquake damaged masonry - a preliminary study  
AU CANDY=CCE; BODYCOAT=R; TRUEMAN=PG  
AULOC Halpern Glick Maunsell Duncan Stephen and Mercer Halpern Glick Maunsell  
SOURCE Fifth national conference on engineering heritage 1990: Perth 3-5 December 1990: preprints of papers. p65-74  
IMPRINT Barton: IEAust, 1990  
COLLATION 10p ill chart 22 refs  
SERIES National Conference Publication (IEAust) no 90/16  
AB The preliminary architectural and engineering rationale which preceded conceptual design of Stage 1 of the Notre Dame University Australia is presented. The reuse of the 130 year old Heritage buildings of J & W Bateman of Fremantle, Western Australia, involved rehabilitating a number of old, fragile rubble limestone and clay brickwork walls. Little guidance is given in the literature, and little case history data is available on this type of work. Earthquake activity is thought to have damaged many of the wall structures, and a study thereof has shown that mild earthquake events impinging on the greater Perth area are increasing in frequency and possibly in magnitude. Techniques for strengthening the walls are discussed together with preliminary resolution of the important factors involved. The results of the a trial involving tie bar pull-out tests in the rubble limestone walls are presented with preliminary indicative core strengths of this masonry. Conclusions are drawn from the work to date on this particular building study, which have broader application to and indicate future directions for Heritage buildings in general.  
DE MASONRY MATERIALS - repair  
MINOR BUILDINGS - walls; BUILDINGS - structural design; BUILDINGS - structural analysis; BUILDINGS - restoration; BUILDINGS - conservation; BUILDINGS - brick; MASONRY MATERIALS - earthquake resistance; MASONRY MATERIALS - cracking; STRENGTH OF MATERIALS - analysis; STANDARDS  
ID UNREINFORCED MASONRY; ARCHITECTURAL CONSERVATION; WATER BORNE DEGRADATION; FOUNDATION SETTLEMENTS; EARTHQUAKE DATA ASSIMILATION; BATEMAN BUILDINGS; MILD SEISMIC EVENT; MODERATE SEISMIC EVENT, AS2121 1979; AS1170 1989; FUTURE FORCES; WIND LOADING; AQUEOUS LEACHING; CORROSION PRESSURES; CRACK INJECTION; FIBRE REINFORCED RENDER; STEEL PINS; EPOXY; CEMENTITIOUS GROUT; RETROFIT DAMP PROOFING; CLEAR IMPREGNATING SURFACE TREATMENT

000000911085

TI Into space from Australia - the early days  
AU JAMES=ML

AULOC Australian Space Policy Institute  
SOURCE Fifth national conference on engineering heritage 1990: Perth 3-5 December 1990: preprints of papers. p53-63  
IMPRINT Barton: IEAust, 1990  
COLLATION 11p 34 refs  
SERIES National Conference Publication (IEAust) no 90/16  
AB The existing early years of Australian and New Zealand space activities are described, commencing with the development of Woomera as a missile test facility and subsequently as a major rocket range, with tracking facilities. At the peak of its operation, Woomera was used for major international launch vehicles, some of which placed satellites into orbit. Tracking and support operations are introduced, featuring those provided by the USA but built by local industries. They include stations used for tracking NASA piloted and planetary spacecraft, as well as those built for defence satellite communications and surveillance. Australia's first two satellites, Wresat and Australis are covered, along with other space science and applications activities, particularly - astronomy, indicating the high level of expertise achieved by local space technologists at the start of the space age. Space applications, remote sensing and meteorology, which have now become well developed as Australia regains its position in advanced technologies and international space programs. Space activities in New Zealand, such as science and applications are also described. The role and history of public space education programs and organisations is outlined to conclude the paper. It also contains an historical space bibliography.

DE AEROSPACE ENGINEERING - Australia  
MINOR ROCKETS AND MISSILES - military; ROCKETS AND MISSILES - launching; ROCKETS AND MISSILES - tracking; ROCKETS AND MISSILES - testing; SATELLITES - launching; SATELLITES - remote sensing; SATELLITES - weather; COMMUNICATION SATELLITES; AEROSPACE GROUND SUPPORT; TECHNOLOGY - economic and sociological effects; AEROSPACE ENGINEERING - New Zealand  
ID ASTRONAUTICS; UNITED KINGDOM; UNITED STATES; EUROPEAN LAUNCHER DEVELOPMENT; DEVELOPMENT ORGANISATION; DEFENCE FACILITIES; WRESAT; AUSTRALIS; SPACE SCIENCE; ASTRONAUTS; AUSTRALIAN SPACE RESEARCH AGENCY; OVERSEAS TELECOMMUNICATIONS COMMISSION; AUSSAT; METEOROLOGICAL SATELLITES; SPACEMOBILE EXHIBITIONS

000000911084

TI Interpreting the engineering history of telephony in Western Australia, 1887-1987  
AU MOYNIHAN=JF  
AULOC Telecom Australia  
SOURCE Fifth national conference on engineering heritage 1990: Perth 3-5 December 1990: preprints of papers. p45-52  
IMPRINT Barton: IEAust, 1990  
COLLATION 8p 30 refs  
SERIES National Conference Publication (IEAust) no 90/16  
AB The paper discusses the growth of Western Australia's telephone network during its first 100 years of operation. Western Australia first experimented with telephones in 1878, but it was 1887 before a public telephone exchange was opened, at Perth. Although having one of Australia's early automatic exchanges (at Perth) in 1914, growth of the telephone network was relatively slow until after the World War and especially

since the 1960s. At that time coaxial cables, microwave radio systems and crossbar exchanges emerged leading up to digital transmission and switching systems in the 1980s.  
DE TELEPHONE SYSTEMS - Western Australia  
MINOR TECHNOLOGY - economic and sociological effects  
TELECOMMUNICATION SYSTEMS - Western Australia; TELEPHONE EXCHANGES; TELEPHONE EXCHANGES, AUTOMATIC; TELEPHONE SWITCHING EQUIPMENT; TELECOMMUNICATION CABLE - underground; ENGINEERING WRITING; PHOTOGRAPHY; INFORMATION DISSEMINATION  
ID KIMBERLEY MICROWAVE SYSTEM; SUBSCRIBER TRUNK DIALING; ARFCROSSBAR; ARE-11 PROCESSOR; UPGRADING; DIGITAL AXE EXCHANGE; COLONIAL SYSTEM; FEDERATION; PERTH; POWAR; TELECOM AUSTRALIA; AUSSAT

000000911083

TI The computer conservation society - machines of 1950's restored to life in the Science Museum, London  
AU ELLIOTT=WS; SALE=AE  
AULOC Imperial College, London Science Museum, London  
SOURCE Fifth national conference on engineering heritage 1990: Perth 3-5 December 1990: preprints of papers. p39  
IMPRINT Barton: IEAust, 1990  
COLLATION 6p ill  
SERIES National Conference Publication (IEAust) no 90/16  
AB The Science Museum, London, has set up a restoration program for historic computing machines. In this, it the help of the Computer Conservation Society which brings together some of the pioneers who designed and worked on the historic machines. The paper discusses the reasons why computers should be restored, and the criteria used in selecting a computer for restoration. The paper also details the historical background to some of the machines which the Science Museum possesses and which are being considered for restoration.  
DE COMPUTERS - conservation; MUSEUMS - London  
MINOR TECHNOLOGY - economic and sociological effects  
SOCIETIES AND INSTITUTIONS - London; ELECTRONICS ENGINEERING - professional aspects  
ELECTRONICS ENGINEERING - social aspects  
COMPUTER HARDWARE; COMPUTER SOFTWARE  
COMPUTERS, DIGITAL; COMPUTER ARCHITECTURE; NAVAL VESSELS - computer applications  
ID PERSONNEL REQUIREMENT; NPL PILOT AIR ELLIOTT 401; FERRANTI PEGASUS; STANT ZEBRA; ELLIOTT 803; DEC PDP 8; TOTALISATOR DOG TRACK BETTING ODDS CALCULATOR  
ELLIOTT BROTHERS; NATIONAL RESEARCH DEVELOPMENT CORPORATION (UNITED KINGDOM)

000000911082

TI The road to heritage  
AU WAPLES=IK  
AULOC Department of Transport, Queensland  
SOURCE Fifth national conference on engineering heritage 1990: Perth 3-5 December 1990: preprints of papers. p35  
IMPRINT Barton: IEAust, 1990  
COLLATION 4p ill  
SERIES National Conference Publication (IEAust) no 90/16  
AB The paper outlines the progress made by the Road Division, Department of Transport in its endeavour to preserve its heritage, and also summarises the heritage situation in the Departments of Railways, Transport and Harbours and Marine which, together with



AULOC SOURCE	Australian Space Policy Institute Fifth national conference on engineering heritage 1990: Perth 3-5 December 1990: preprints of papers. p53-63 Barton: IEAust, 1990				
IMPRINT COLLATION SERIES AB	11p 34 refs National Conference Publication (IEAust) no 90/16 The existing early years of Australian and New Zealand space activities are described, commencing with the development of Woomera as a missile test facility and subsequently as a major rocket range, with tracking facilities. At the peak of its operation, Woomera was used for major international launch vehicles, some of which placed satellites into orbit. Tracking and support operations are introduced, featuring those provided by the USA but built by local industries. They include stations used for tracking NASA piloted and planetary spacecraft, as well as those built for defence satellite communications and surveillance. Australia's first two satellites, Wresat and Australis are covered, along with other space science and applications activities, par- ticularly - astronomy, indicating the high level of exper- tise achieved by local space technologists at the start of the space age. Space applications, remote sensing and meteorology, which have now become well devel- oped as Australia regains its position in advanced technologies and international space programs. Space activities in New Zealand, such as science and appli- cations are also described. The role and history of public space education programs and organisations is outlined to conclude the paper. It also contains an historical space bibliography.				
DE MINOR	AEROSPACE ENGINEERING - Australia ROCKETS AND MISSILES - military; ROCKETS AND MISSILES - launching; ROCKETS AND MISSILES - tracking; ROCKETS AND MISSILES - testing; SATEL- LITES - launching; SATELLITES - remote sensing; SATELLITES - weather; COMMUNICATION SATEL- LITES; AEROSPACE GROUND SUPPORT; TECH- NOLOGY - economic and sociological effects; AEROSPACE ENGINEERING - New Zealand ASTRONAUTICS; UNITED KINGDOM; UNITED STATES; EUROPEAN LAUNCHER DEVELOPMENT; DEVELOPMENT ORGANISATION; DEFENCE FA- CILITIES; WRESAT; AUSTRALIS; SPACE SCIENCE; ASTRONAUTS; AUSTRALIAN SPACE RESEARCH AGENCY; OVERSEAS TELECOMMUNICATIONS COMMISSION; AUSSAT; METEOROLOGICAL SAT- ELLITES; SPACEMOBILE EXHIBITIONS				
ID					
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TI	Interpreting the engineering history of telephony in Western Australia, 1887-1987				
AU	MOYNIHAN=JF				
AULOC	Telecom Australia				
SOURCE	Fifth national conference on engineering heritage 1990: Perth 3-5 December 1990: preprints of papers. p45-52 Barton: IEAust, 1990				
IMPRINT COLLATION SERIES AB	8p 30 refs National Conference Publication (IEAust) no 90/16 The paper discusses the growth of Western Australia's telephone network during its first 100 years of opera- tion. Western Australia first experimented with tel- ephones in 1878, but it was 1887 before a public telephone exchange was opened, at Perth. Although having one of Australia's early automatic exchanges (at Perth) in 1914, growth of the telephone network was relatively slow until after the World War and especially				
DE MINOR					
ID					
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TI	The computer conservation society - machines of the 1950's restored to life in the Science Museum, London				
AU	ELLIOTT=WS; SALE=AE				
AULOC	Imperial College, London Science Museum, London				
SOURCE	Fifth national conference on engineering heritage 1990: Perth 3-5 December 1990: preprints of papers. p39-44 Barton: IEAust, 1990				
IMPRINT COLLATION SERIES AB	6p ill National Conference Publication (IEAust) no 90/16 The Science Museum, London, has set up a restoration program for historic computing machines. In this, it has the help of the Computer Conservation Society which brings together some of the pioneers who designed and worked on the historic machines. The paper discusses the reasons why computers should be restored, and the criteria used in selecting a computer for restoration. The paper also details the historical background to two of the machines which the Science Museum pos- sesses and which are being considered for restoration.				
DE MINOR	COMPUTERS - conservation; MUSEUMS - London TECHNOLOGY - economic and sociological effects; SOCIETIES AND INSTITUTIONS - London; ELEC- TRONICS ENGINEERING - professional aspects; ELECTRONICS ENGINEERING - social aspects; COMPUTER HARDWARE; COMPUTER SOFTWARE; COMPUTERS, DIGITAL; COMPUTER ARCHITEC- TURE; NAVAL VESSELS - computer applications PERSONNEL REQUIREMENT; NPL PILOT ACE; ELLIOTT 401; FERRANTI PEGASUS; STANTEC ZEBRA; ELLIOTT 803; DEC PDP 8; TOTALISATORS; DOG TRACK BETTING ODDS CALCULATORS; ELLIOTT BROTHERS; NATIONAL RESEARCH DE- VELOPMENT CORPORATION (UNITED KINGDOM)				
ID					
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TI	The road to heritage				
AU	WAPLES=IK				
AULOC	Department of Transport, Queensland				
SOURCE	Fifth national conference on engineering heritage 1990: Perth 3-5 December 1990: preprints of papers. p35-38 Barton: IEAust, 1990				
IMPRINT COLLATION SERIES AB	4p ill National Conference Publication (IEAust) no 90/16 The paper outlines the progress made by the Roads Division, Department of Transport in its endeavour to preserve its heritage, and also summarises the herit- age situation in the Departments of Railways, Trans- port and Harbours and Marine which, together with the				
DE MINOR					
ID					
000000911081					
TI	Engineers' papers: an undervalued historical source				
AU	DWYER=MR				
AULOC	University of Sydney Archives				
SOURCE	Fifth national conference on engineering heritage 1990: Perth 3-5 December 1990: preprints of papers. p29-34 Barton: IEAust, 1990				
IMPRINT COLLATION SERIES AB	6p ill 24 refs National Conference Publication (IEAust) no 90/16 The aim of this paper is to draw attention to the heritage value of unpublished paper records of Australia's engineers with emphasis on documents other than plans, drawings, photographs and blueprints. These documents include correspondence, diaries, and other papers created by the engineer in private life, as well as working papers, correspondence and other records arising from the engineers's technical work. The poten- tial value of preserving such personal archives in an archival repository, to enable future generations of Australians to interpret their engineering heritage, is illustrated by reference to the papers, now in the University of Sydney Archives, of W H Warren (1852- 1926), S H E Barraclough (1874-1958) and T D J Leech (1902-73). Experience at the University Archives leads to the conclusion that significant resources for the interpretation of Australia's engineering heritage would become available if the preservation of archivally valuable papers of engineers and engineering was less due to accident and more to design.				
DE MINOR	ENGINEERING WRITING - conservation ENGINEERING EDUCATION - Sydney; ENGINEER- ING - professional aspects; ENGINEERING - public policy; ENGINEERING - social aspects; ENGINEERS - biographies; ENGINEERING WRITING - protection; INFORMATION DISSEMINATION; WATER RE- SOURCE				
ID	WARREN=WH; BARRACLOUGH=SHE; LEECH=TDJ; PROFESSIONAL LIFE; PRIVATE LIFE; PUBLISHED INFORMATION; UNPUBLISHED INFORMATION; PERSONAL ARCHIVES; CORRESPONDENCE; HIS- TORY; GOVERNMENT; CHRISTIANSEN=WH				
000000911080					
TI	Misinterpreting engineering heritage				
AU	WHITMORE=RL				
AULOC	University of Queensland				
SOURCE	Fifth national conference on engineering heritage 1990: Perth 3-5 December 1990: preprints of papers. p25-28 Barton: IEAust, 1990				
IMPRINT COLLATION SERIES AB	4p ill 6 refs National Conference Publication (IEAust) no 90/16 The paper presents a number of cases where errors				



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TI Cylindrical arched dams of New South Wales, 1896-1908: "work of a courageous nature"

AU MacKENZIE=P; HEINRICHS=P; COLTHEART=L

AULOC Public Works Department, New South Wales

SOURCE Fifth national conference on engineering heritage 1990: Perth 3-5 December 1990: preprints of papers. p9-15 Barton: IEAust, 1990

IMPRINT

COLLATION 7p ill charts 15 refs

SERIES

AB National Conference Publication (IEAust) no 90/16 The innovative era of cylindrical arch dam construction in New South Wales from 1896 represents an important element in the move away from British engineering traditions in the Australian colonies. The historic significance of thirteen dams built over thirteen years is discussed, and design features, construction problems and contemporary safety assessments are outlined. The need for full recording, a community awareness programme and appropriate management policies is stressed.

DE DAMS, ARCH - New South Wales

MINOR REGIONAL PLANNING - water supply; DAMS, ARCH - design; DAMS, ARCH - construction; DAMS, ARCH - stresses; DAMS, ARCH - failure; DAMS, ARCH - computer aided analysis; CIVIL ENGINEERING - public policy; CIVIL ENGINEERING - project management; MATHEMATICAL TECHNIQUES - finite element method

ID HISTORY; HERITAGE POLICY; DARLEY=DW; THIN CYLINDER METHOD; COUNTRY TOWNS; BEAR VALLEY DAM; MEDLOW DAM; LITHGOW NO 1 DAM; PARKES DAM; BUMBERRY; COOTAMUNDRA DAM; TAMWORTH DAM; MOORE CREEK; WELLINGTON DAM; MUDGEE DAM; REDBANK CREEK; CROWN CANTILEVER ANALYSIS; FINITE ELEMENT ANALYSIS; PARRAMATTA; PARKES; PICTON; QUEEN CHARLOTTE VALE; KATOOMBA; LITHGOW NO 2 DAM; MITTAGONG

000000911077

TI A heritage of waste

AU CLARKE=MN; COLHEART=L

AULOC Public Works Department, New South Wales

SOURCE Fifth national conference on engineering heritage 1990: Perth 3-5 December 1990: preprints of papers. p1-7 Barton: IEAust, 1990

IMPRINT

COLLATION 7p ill 21 refs

SERIES

AB National Conference Publication (IEAust) no 90/16 The history of engineering in two bays of Sydney Harbour adjacent to the city, shows the impact of waste and waste disposal works on the road system and pattern of suburban growth. Interpreting waste disposal engineering sites is an important but neglected element of Australian history. Researching such sites should be conducted independent of redevelopment or conservation issues.

DE PORTS AND HARBORS - Sydney; URBAN PLANNING - waste disposal

MINOR URBAN PLANNING - transportation; URBAN PLANNING - drainage; REFUSE DISPOSAL - environmental impact; WASTE DISPOSAL - environmental impact; SEWERS - storm drainage; SEWERS - sanitary; PORTS AND HARBORS - dredging; HEALTH HAZARDS; ENGINEERING - public policy; ENVIRONMENTAL CONSERVATION

ID GARBAGE DISPOSAL; PUBLIC HEALTH; BLACKWATTLE BAY; NEW VICTORIAN AGE;

ABATOIR; GLEBE ISLAND; BLACKWATTLE SWAMP RECLAMATION; LOBBYING; HOUSING; GLEBE ISLAND BRIDGE REPLACEMENT; PYRMONT BRIDGE; HARBOUR

000000911010

TI History of the conservation zone

SOURCE Engineers Australia. v63, n4, March 8 1991. p18

IMPRINT Crows Nest: Engineers Australia, 1991

COLLATION 6 pars

DE CONSERVATION - Northern Territory; REGIONAL PLANNING - zoning

MINOR MINERAL INDUSTRY AND RESOURCES - Australia; MINES AND MINING - environmental impact; MINERAL EXPLORATION - Northern Territory; REGIONAL PLANNING - land use; PARKS - Northern Territory; URANIUM MINES AND MINING; ENVIRONMENTAL PROTECTION

ID ENGINEERING HERITAGE; CALLANAN=Joe; WALPOLE=Bruce; UNITED URANIUM NL; CORONATION HILL JOINT VENTURE; NEWMONT AUSTRALIA LTD; PLUTONIC RESOURCES LTD; NORGOLD LTD; JAWOYN ABORIGINES; SICKNESS COUNTRY; NORTHERN LAND COUNCIL; AUSTRALIA. Resource Assessment Commission

000000910950

TI Heritage preserved

AU GRAD=P

AULOC EA Staff Writer

SOURCE Engineers Australia. v63, n8, May 3 1991. p30

IMPRINT Crows Nest: Engineers Australia, 1991

COLLATION 16 pars ill

DE BUILDINGS - restoration; ENGINEERING - project management

MINOR BUILDING MATERIALS - selection; BUILDINGS - design; BUILDINGS - construction; BUILDINGS - Sydney; CIVIL ENGINEERING

ID ENGINEERING HERITAGE; HERITAGE RESTORATION; COMMONWEALTH BANK HEADQUARTERS; LEIGHTON CONTRACTORS PTY LTD; DOCUMENTATION

000000910803

TI The Institution of Engineers, Australia. Canberra Division: highlights of the Division's activities 1927-1987

AU INSTITUTION OF ENGINEERS, AUSTRALIA. Canberra Division

IMPRINT Barton: IEAust. Canberra Division, 1987

COLLATION 19p

AB During 1985, the Chairman of the Division, Mr Alva Purkiss, suggested that the activities of the Division, based on a review of all the meeting records, should be recorded to mark the 60th Anniversary. The suggestion was taken up by the Heritage Sub-committee. The review covered some 1100 meetings from the second Provisional Committee Meeting in April 1927 to the most recent available minutes: 530 Committee Meetings, 390 General Meetings, 59 Annual General Meetings, 59 Annual Reports, 47 Executive Meetings and 15 Special Meetings. The Division is indebted to Mr R. McIntyre for undertaking this formidable task and producing this valuable record.

DE SOCIETIES AND INSTITUTIONS - Canberra

MINOR ENGINEERING - professional aspects; ENGINEERING - public policy; ENGINEERING - social aspects; ENGINEERS; INFORMATION DISSEMINATION -

speech communication; SOCIETIES AND INSTITUTIONS - Australia

ID DIAMOND JUBILEE; HISTORY; ENGINEERING HERITAGE; FORMATION; BRANCHES; COMMUNITY ASPECTS; STATUS OF ENGINEERS; WORLD WAR TWO; FIRST FEMALE MEMBER; CONFERENCES; POST WAR YEARS; DIVISIONAL ADMINISTRATION; CHAIRMEN; ARTHUR CORBETT PRIZE; HONORARY FELLOWS; HONOURS; RJN FRANKIE MEDAL

000000910765

TI Development and the environment - the Pilbara experience

AU STEWART=DS

SOURCE National engineering conference 1991: development and the environment: 8-12 April 1991 Wrest Point Convention Centre Hobart: preprints of papers. p1-5 Barton: IEAust, 1991

IMPRINT

COLLATION 5p

SERIES

AB National Conference Publication (IEAust) no 91/3 The Pilbara region of North Western Australia had an early history of mining - gold, lead, tin - late last century into the first decade of this, but laid dormant until the enormous growth from the late 1960s to the present day. Over that period were established the most efficient iron ore operations in the world, exporting over a period of 23 years some \$A21.4 billion, supplemented by some \$A875 million of salt from highly efficient producers in the area. With the encouragement of the producers; an understanding of the environment was developed with the establishment of a major Government Regional Herbarium, the declaration of some national parks, and the recording and cataloguing of a widespread and extensive array of Petrographs, middens and artifacts of a prehistoric Aboriginal culture. The achievement of this enormous development and its ongoing competence is a proud record of Australian Engineers in design, construction and operations, and in the response of the Australian Heavy Engineering Industry in the late 1960s and '70s.

DE MINES AND MINING - Pilbara

MINOR TECHNOLOGY - economic and sociological effects; INDUSTRIAL ECONOMICS; GOLD MINES AND MINING; COPPER MINES AND MINING; LEAD MINES AND MINING; IRON MINES AND MINING; SALT MINES AND MINING; PORTS AND HARBORS; RAILROADS; ELECTRIC POWER DISTRIBUTION; WATER SUPPLY; ENVIRONMENTAL PROTECTION

ID ENGINEERING HERITAGE; HISTORY; INDUSTRIAL INFRASTRUCTURE; HARBOURS; ELECTRICAL SUPPLY; SOCIAL INFRASTRUCTURE; FLORA; REVEGETATION

000000910764

TI Goolwa - Port Elliot Railway and extensions to Victor Harbor and Strathalbyn: a statement of the engineering heritage significance of the railway

AU INSTITUTION OF ENGINEERS, AUSTRALIA. South Australian Division

IMPRINT s.l.: s.n., 1990

COLLATION 12p 6 refs

AB In December 1853, Australia's first railway made the vital link between the River Murray and a seaport to capture for South Australia river trade from as far afield as Queensland. Originally animal powered, the railway was extended to Victor Harbor in 1864, Strathalbyn in 1869 and connected in 1884 to the intercolonial railway



period. The last stage from 1900 to 1970s saw the area gradually decline in importance as a commercial and residential sector. The purpose of this paper is to provide a framework for the subsequent papers which examine some aspects of the history of the South Brisbane in detail. The aim therefore is to take a broad view of the history of the area, to highlight the major factors which have shaped the development of the South Brisbane.

DE URBAN PLANNING - Brisbane; REGIONAL PLANNING - Brisbane

MINOR TECHNOLOGY - economic and sociological effects; CONSTRUCTION INDUSTRY; INDUSTRIAL ECONOMICS; DOCKS; RAILROADS; BRIDGES; URBAN PLANNING - Queensland; REGIONAL PLANNING - Queensland

ID EARLY DEVELOPMENT; DRY DOCK; RAILWAY LINE; VICTORIA BRIDGE; STORY BRIDGE; CAPTAIN COOK BRIDGE; ENGINEERING HERITAGE

000000900385

TI Canberra's engineering heritage: Second Edition

AU ANDREWS=WC; SHELLSHEAR=W; COOPER=I; PASCOE=L; MORISON=I; PRICE=CJ; DALGARNO=KJ; MINTY=AE; JONES=HA; CLARK=P; YONGE=P; CORBETT=AH; COOKE=TH; LESLIE=R; DALGLEISH=RPS; TAYLDER=AE; DOWNEY=KE; CONNALL=JK

IMPRINT Barton: IEAust Canberra Division, 1990

COLLATION 242p ill charts

AB The book has been written for both the engineer and the general reader. The primary aim has been to record the progressive development of this region from the first visit of Europeans in 1820 to the present, with particular regard to the roles of engineers in that development: roles which cover numerous branches, from construction of the earliest roads and bridges to work in outer space. Basic technical data has been provided with ample references to further information available elsewhere. The human element has not been overlooked, with the inclusion of anecdotes and stories revealing the attitudes and foibles of some of those involved in the planning and development of what are now our heritage items.

DE ENGINEERING - Canberra

MINOR ROADS AND STREETS; BRIDGES; RAILROADS; URBAN PLANNING - transportation; LAKES; DAMS; WATER SUPPLY; ELECTRIC POWER GENERATION; STREET LIGHTING; MILITARY ENGINEERING; TELECOMMUNICATION; ENGINEERING EDUCATION; AEROSPACE ENGINEERING; AEROSPACE GROUND SUPPORT; OFFICE BUILDINGS; HIGHWAY ENGINEERING; NATURAL GAS; AVIATION

ID RAILWAYS; PUBLIC TRANSPORT; PUBLIC LIGHTING; SPACE TRACKING STATIONS; NEW PARLIAMENT HOUSE; ROYAL MILITARY COLLEGE (DUNTRON ACT)

000000900060

TI Development: what does history tell us about the financing of projects and their cyclic nature

AU LE PAGE=JSH

SOURCE Capitalising on resource project opportunities: papers of the 1988 bicentennial seminar Perth, 19 July 1988. p 18-35

IMPRINT Perth: IEAust. Western Australia Division, 1988

COLLATION 18 p

AB If there is one thing that history tells us, it is that there are a lot fewer new ideas in the financing of development projects than one imagines. Most of us probably think that ideas like privatisation, resources tax, or government and private sector partnerships are products of our own time. Perhaps the words are, but the ideas are not. I hope to demonstrate this to you by describing a number of projects developed in this state during the nineteenth century.

DE PUBLIC WORKS - costs; ENGINEERS - project management

MINOR PUBLIC WORKS - Western Australia; HIGHWAY SYSTEMS - planning; BUILDINGS - construction; TELEGRAPH SYSTEMS - construction; RAILROADS - construction; WATER SUPPLY - planning; TRANSPORTATION; TELECOMMUNICATIONS; INDUSTRIAL ECONOMICS

ID ENGINEERING HERITAGE; FUNDING; GOVERNMENT; CONVICT LABOUR; RETICULATED WATER; PERTH

000000900003

TI Bulk materials handling - a key discipline of engineering

AU ROBERTS=AW

AULOC University of Newcastle

SOURCE Transactions of The Institution of Engineers, Australia: Mechanical Engineering. v ME14, n 2, 1989. p 84-96

IMPRINT Barton: IEAust, 1989

COLLATION 13 p ill charts 65 refs

AB This paper reviews, in a somewhat unstructured way, some basic characteristics of Australia's technological and engineering heritage, and highlights some salient aspects of bulk solids handling particularly from the point of view of my own experience. The field of bulk solids handling is quite extensive, and embraces a broad range of engineering disciplines such as applied mechanics, particulate mechanics, two phase flow, mechanical design, vibration analysis, control systems theory, engineering economics, structural design, chemical reactions, transportation and conveying, minerals extraction and processing, systems theory, industrial engineering principles and optimisation theory. Problems range from complex fundamental analytical type problems concerned with extending the understanding of constitutive properties of powders and bulk solids, to applied problems emanating from industry where immediate solutions to complex and often intriguing plant handling and process problems are required. For me it has been a most satisfying field in which to specialise, particularly in view of its importance to Australia's industrial and economic development. One would like to see more effort in the future to the enhancement of the technology of bulk materials handling through avenues such as increased local design of handling and processing equipment and machinery, not only for local use but also for export.

DE MATERIALS HANDLING - Australia

MINOR TECHNOLOGY - economic and sociological effects; PATENTS AND INVENTIONS; INDUSTRIAL ECONOMICS; MATERIALS HANDLING - equipment; MATERIALS HANDLING - research; FLOW OF SOLIDS - research; SILOS - design

ID MICHELL=AGM; MICHELL THRUST AND JOURNAL BEARING; MINERAL EXPORTS; MASS FLOW; FUNNEL FLOW; WOLLONGONG UNIVERSITY COLLEGE; UNIVERSITY OF NEWCASTLE; SILO

QUAKING; GRANULAR JUMPS; MICHELL 1  
BULK SOLID BEARING; INSTITUTION OF ENGINEERS, AUSTRALIA

000000900002

TI Newcastle, a pioneer of Australia's bulk material systems

AU PLANNER=JH

AULOC Gutteridge Haskins & Davey

SOURCE Transactions of The Institution of Engineers, Australia: Mechanical Engineering. v ME14, n 2, 1989. p 7

IMPRINT Barton: IEAust, 1989

COLLATION 11 p ill charts 14 refs

AB The Port of Newcastle was the forerunner of Australian bulk materials port systems. It has developed from a primitive beginning in 1801, to become Australia's most diversified bulk handling port. A brief history provided of the development of Australia's port terms for handling coal, grain, iron ore and sugar

DE MATERIALS HANDLING - Australia; PORTS

MINOR HARBORS - Newcastle

GRAIN-handling; COAL HANDLING - hoppers; SUGAR HANDLING; ORE HANDLING; IRON AND STEEL INDUSTRY - Newcastle; MATERIALS HANDLING - New South Wales; PORTS AND HARBORS - Hunter Valley; SHIPS - loading

ID HUNTER VALLEY RIVER PORTS; EARLY MECHANICAL SHIPLOADING; REMOVABLE COAL HOPPER BULK HANDLING; PRIMITIVE SUGAR PORTS; DEEPWATER BULK SUGAR PORTS; STEEL INDUSTRY PORT; REMOVABLE COAL HOPPER WAGONS; BOOM TYPE SHIPLOADER; HISTORIC HARBOURS

000000892833

TI Sydney from settlement to city: an engineering history of Sydney

AU INSTITUTION OF ENGINEERS, AUSTRALIA. Sydney Division. Engineering Heritage Committee

IMPRINT Sydney: EA on behalf of the Engineering Heritage Committee, Sydney Division, 1987

COLLATION 328 p ill charts

AB This book traces the engineering developments which have taken place in Sydney, although some of the ideas of Sydney engineers have spread throughout the world. It is a fascinating story, interestingly told, of the endeavours and tribulations of many of the engineers who have worked in the cradle of the nation over the two centuries since our beginnings.

DE ENGINEERING - Sydney

MINOR WATER SUPPLY; SEWERS; ROADS AND STREETS; RAILROADS; BRIDGES; PORTS AND HARBORS; GAS INDUSTRY; CHEMICAL ENGINEERING; MECHANICAL ENGINEERING; BUILDINGS; TELECOMMUNICATION; ELECTRIC RAILROADS; ELECTRIC POWER GENERATION; ENGINEERING EDUCATION; AEROSPACE ENGINEERING; MARINE ENGINEERING

ID FRASER=DON; ENGINEERING HERITAGE; SYDNEY; SHIP BUILDING AND REPAIR; HEAVY ENGINEERING INDUSTRY; TRAMWAYS; ELECTRICITY SUPPLY; AERONAUTICAL ENGINEERING HARBOURS

000000892657

TI Aeronautical Research Laboratories - half a century through a glass darkly



ship of engineering heritage to the Register of the National Estate is that of specialist input to a generalized approach. The engineer must be aware of the nature of the conservation process, and be prepared to participate in it in order to achieve the protection of engineering heritage items as part of the national estate.

DE ENGINEERING - conservation  
MINOR ENGINEERING - professional aspects; ENGINEERING - public policy; CONSERVATION - planning  
ID MOVEABLE ITEMS; ROLE OF THE ENGINEER

000000890608

TI Engineering a future for the past: engineers and educators  
AU ROGERS=B  
AULOC University of Wollongong  
SOURCE Third national conference on engineering heritage, 1986: practices and responsibilities of engineering heritage: the University of Adelaide 1-3 December 1986: Preprints of papers. p 16-21  
IMPRINT Barton: IEAust, 1986  
COLLATION 6 p charts 10 refs  
SERIES National Conference Publication (IEAust) no 86/14  
AB The engineering profession has a threefold responsibility for its heritage - to identify heritage items, to ensure their conservation, and to help the general public to appreciate the heritage through education. While considerable work has been done in relation to identification and conservation, relatively little has been done in the way of education outside the profession. In fulfilling this educational obligation, the approach should be evaluative and interpretative, following the role of an art critic in the interpretation of the cultural heritage. Modern approaches to school curriculum make it not only possible but desirable, to begin education about engineering heritage in primary and secondary schools. This participation requires collaboration with skilled teachers to ensure appropriate design of inquiry based learning materials. Architects and planners are already working with schools both overseas and in Australia in projects such as Art and the Built Environment. Adoption of a similar approach by engineers would do much for education about the engineering heritage.

DE ENGINEERING - conservation  
MINOR ENGINEERING - teaching  
ID ENGINEERING - professional aspects  
AESTHETICS; CRITICISM; ENGINEERING HERITAGE; HERITAGE EDUCATION; INQUIRY LEARNING; EDUCATIONAL PROCESSES; DISCOVERY LEARNING

000000890607

TI Heritage programs of the American Society of Civil Engineers  
AU FITZSIMONS=N  
AULOC ASCE  
SOURCE Third national conference on engineering heritage, 1986: practices and responsibilities of engineering heritage: the University of Adelaide 1-3 December 1986: Preprints of papers. p 13-15  
IMPRINT Barton: IEAust, 1986  
COLLATION 3 p  
SERIES National Conference Publication (IEAust) no 86/14  
AB History and Heritage programs seek to educate both our profession, and the public at large, in all facets of the history of Civil Engineering from the monumental to

the mundane. In this way we will all come to better understand the role engineers have had, and continue to have in transforming society. The Engineering Profession even before it was formally recognised as such, has always responded to society's changing needs and demands, and has therefore had an enormous impact on our economy, the appearance of our landscape, and the health of our people. The fruits of our predecessors' labour make up the heritage that is entrusted to us. It is our duty to know it and protect it, so that others may know it, learn from it, and enjoy it. The history and heritage programs of ASCE, so many and varied, are in keeping with this duty.

DE CIVIL ENGINEERING - conservation  
MINOR SOCIETIES AND INSTITUTIONS - America; ENGINEERS - biographies; CIVIL ENGINEERING - record preservation; CIVIL ENGINEERING - exhibitions; ENGINEERING WRITING - conservation  
ID LANDMARK PROGRAM; ORAL HISTORY; HISTORIC AMERICAN ENGINEERING RECORD; HISTORICAL PUBLICATIONS AND SHOWS; HISTORY SESSIONS; AMERICAN SOCIETY OF CIVIL ENGINEERS. Committee on the History and Heritage of American Civil Engineering

000000890606

TI Who has the responsibility? Preservation of tin technology at Irvinebank, North Queensland  
AU KERR=RS  
AULOC Queensland State Archives  
SOURCE Third national conference on engineering heritage, 1986: practices and responsibilities of engineering heritage: the University of Adelaide 1-3 December 1986: Preprints of papers. p 10-12  
IMPRINT Barton: IEAust, 1986  
COLLATION 3 p 6 refs  
SERIES National Conference Publication (IEAust) no 86/14  
AB This paper describes the tin technology which has survived in the Irvinebank area in North Queensland, also analyses the interest and responsibility shown by local people in preserving that technology. The paper seeks to highlight the role of enterprising private individuals in preservation, without the assistance of a framework of heritage legislation and with little financial help.

DE TIN MINES AND MINING - conservation  
MINOR MINING ENGINEERING - conservation; TECHNOLOGY - conservation; INDUSTRIAL PLANTS - conservation  
ID ENGINEERING HERITAGE; MINING TECHNOLOGY; RESTORATION; MOFFAT=John; LOUDOUN MILL; TECHNOLOGICAL HERITAGE; HERITAGE LEGISLATION; TIN MILL

000000890605

TI Some conservation strategies for mechanical engineering heritage  
AU MILNER=P  
AULOC University of Melbourne  
SOURCE Third national conference on engineering heritage, 1986: practices and responsibilities of engineering heritage: the University of Adelaide 1-3 December 1986: Preprints of papers. p 5-9  
IMPRINT Barton: IEAust, 1986  
COLLATION 5 p 1 ref  
SERIES National Conference Publication (IEAust) no 86/14  
AB A critical examination is made of the nature of mechanical

cal engineering artefacts relative to other cultural objects, the particular problems associated with the mobility of these artefacts, the means for presenting them in ways which display their essential significance and the role of museums, private organizations and governments. A taxonomy of mechanical engineering artefacts is constructed, together with an associated set of conservation strategies suggested by the relevant articles in the Burra Charter, and by recent case considered by the Industrial History Committee of the National Trust in Victoria and the Department of Mechanical and Industrial Engineering at the University of Melbourne.

DE MECHANICAL ENGINEERING - conservation  
MINOR MACHINERY - conservation; MUSEUMS; CONSERVATION - legislation; CONSERVATION - planning  
ID NON OPERATIONAL OBJECTS; INCOMPLETE OBJECTS; ICOMOS BURRA CHAPTER; INTERNATIONAL COUNCIL OF MONUMENTS AND SITES

000000890604

TI Heritage - the engineer's nightmare  
AU WHITMORE=RL  
AULOC University of Queensland  
SOURCE Third national conference on engineering heritage, 1986: practices and responsibilities of engineering heritage: the University of Adelaide 1-3 December 1986: Preprints of papers. p 1-4  
IMPRINT Barton: IEAust, 1986  
COLLATION 4 p 8 refs  
SERIES National Conference Publication (IEAust) no 86/14  
AB The size and complexity of many industrial and engineering artefacts makes their selection for indefinite retention a matter of particular difficulty. The paper discusses procedures by which works could be chosen, and examines alternatives to conservation such as comprehensive recording. It is suggested that interstate or international cooperation will be essential if an examples of some industrial processes are to be retained for the benefit of posterity.

DE ENGINEERING - conservation  
MINOR ENGINEERING - record preservation; ENGINEERING WRITING - conservation  
ID ENGINEERING HISTORY; ENGINEERING HERITAGE; INDUSTRIAL ARCHAEOLOGY; RECORDING TECHNIQUES; DOCUMENTATION CONSERVATION; DEFINITION OF SIGNIFICANCE; INVENTORIES; CONSERVATION OF INDUSTRIES

000000890569

TI The changing role of civil engineers in public health engineering  
AU ZEMICK=P  
AULOC Brisbane City Council  
SOURCE Proceedings of the symposium on environmental awareness course, Brisbane 5 October-16 November 1987  
IMPRINT Brisbane: IEAust Queensland Division, 1987  
COLLATION 9 p  
AB This paper examines the role that civil engineers have traditionally played in public health engineering. It also attempts a little crystal ball gazing as to where today's changing perspectives may lead the civil engineer in the future. In particular, the need for civil engineers to update and extend traditional skills and to accept an increasingly multidisciplinary role is emphasized.  
DE ENGINEERING - environmental impact; HEALTH CARE



the mundane. In this way we will all come to better understand the role engineers have had, and continue to have in transforming society. The Engineering Profession even before it was formally recognised as such, has always responded to society's changing needs and demands, and has therefore had an enormous impact on our economy, the appearance of our landscape, and the health of our people. The fruits of our predecessors' labour make up the heritage that is entrusted to us. It is our duty to know it and protect it, so that others may know it, learn from it, and enjoy it. The history and heritage programs of ASCE, so many and varied, are in keeping with this duty.

DE CIVIL ENGINEERING - conservation  
MINOR SOCIETIES AND INSTITUTIONS - America; ENGINEERS - biographies; CIVIL ENGINEERING - record preservation; CIVIL ENGINEERING - exhibitions; ENGINEERING WRITING - conservation

ID LANDMARK PROGRAM; ORAL HISTORY; HISTORIC AMERICAN ENGINEERING RECORD; HISTORICAL PUBLICATIONS AND SHOWS; HISTORY SESSIONS; AMERICAN SOCIETY OF CIVIL ENGINEERS. Committee on the History and Heritage of American Civil Engineering

000000890606

TI Who has the responsibility? Preservation of tin technology at Irvinebank, North Queensland

AU KERR=RS  
AULOC Queensland State Archives  
SOURCE Third national conference on engineering heritage, 1986: practices and responsibilities of engineering heritage: the University of Adelaide 1-3 December 1986: Preprints of papers. p 10-12

IMPRINT Barton: IEAust, 1986  
COLLATION 3 p 6 refs  
SERIES National Conference Publication (IEAust) no 86/14  
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DE TIN MINES AND MINING - conservation  
MINOR MINING ENGINEERING - conservation; TECHNOLOGY - conservation; INDUSTRIAL PLANTS - conservation

ID ENGINEERING HERITAGE; MINING TECHNOLOGY; RESTORATION; MOFFAT=John; LOUDOUN MILL; TECHNOLOGICAL HERITAGE; HERITAGE LEGISLATION; TIN MILL

000000890605

TI Some conservation strategies for mechanical engineering heritage

AU MILNER=P  
AULOC University of Melbourne  
SOURCE Third national conference on engineering heritage, 1986: practices and responsibilities of engineering heritage: the University of Adelaide 1-3 December 1986: Preprints of papers. p 5-9

IMPRINT Barton: IEAust, 1986  
COLLATION 5 p 1 ref  
SERIES National Conference Publication (IEAust) no 86/14  
AB A critical examination is made of the nature of mechanical

cal engineering artefacts relative to other cultural objects, the particular problems associated with the mobility of these artefacts, the means for presenting them in ways which display their essential significance, and the role of museums, private organizations and governments. A taxonomy of mechanical engineering artefacts is constructed, together with an associated set of conservation strategies suggested by the relevant articles in the Burra Charter, and by recent cases considered by the Industrial History Committee of the National Trust in Victoria and the Department of Mechanical and Industrial Engineering at the University of Melbourne.

DE MECHANICAL ENGINEERING - conservation  
MINOR MACHINERY - conservation; MUSEUMS; CONSERVATION - legislation; CONSERVATION - planning

ID NON OPERATIONAL OBJECTS; INCOMPLETE OBJECTS; ICOMOS BURRA CHAPTER; INTERNATIONAL COUNCIL OF MONUMENTS AND SITES

000000890604

TI Heritage - the engineer's nightmare

AU WHITMORE=RL  
AULOC University of Queensland  
SOURCE Third national conference on engineering heritage, 1986: practices and responsibilities of engineering heritage: the University of Adelaide 1-3 December 1986: Preprints of papers. p 1-4

IMPRINT Barton: IEAust, 1986  
COLLATION 4 p 8 refs  
SERIES National Conference Publication (IEAust) no 86/14  
AB The size and complexity of many industrial and engineering artefacts makes their selection for indefinite retention a matter of particular difficulty. The paper discusses procedures by which works could be chosen, and examines alternatives to conservation such as comprehensive recording. It is suggested that interstate or international cooperation will be essential if any examples of some industrial processes are to be retained for the benefit of posterity.

DE ENGINEERING - conservation  
MINOR ENGINEERING - record preservation; ENGINEERING WRITING - conservation

ID ENGINEERING HISTORY; ENGINEERING HERITAGE; INDUSTRIAL ARCHAEOLOGY; RECORDING TECHNIQUES; DOCUMENTATION CONSERVATION; DEFINITION OF SIGNIFICANCE; INVENTORIES; CONSERVATION OF INDUSTRIES

000000890569

TI The changing role of civil engineers in public health engineering

AU ZEMICK=P  
AULOC Brisbane City Council  
SOURCE Proceedings of the symposium on environmental awareness course, Brisbane 5 October-16 November 1987

IMPRINT Brisbane: IEAust Queensland Division, 1987  
COLLATION 9 p  
AB This paper examines the role that civil engineers have traditionally played in public health engineering. It also attempts a little crystal ball gazing as to where today's changing perspectives may lead the civil engineer in the future. In particular, the need for civil engineers to update and extend traditional skills and to accept an increasingly multidisciplinary role is emphasized.

DE ENGINEERING - environmental impact; HEALTH CARE

MINOR ENGINEERING - professional aspects; WATER SUPPLY - water quality; WATER POLLUTION - water quality; WASTEWATER - treatment; WATER TREATMENT - economics

ID HISTORY; ECONOMIC ASPECTS; WASTEWATER EFFLUENT QUALITY; SAFETY ASPECTS; FUTURE TRENDS

000000890362

TI Development of air transport facilities in remote areas

AU FORDHAM=GW; ROGERS=J  
AULOC Airport Planning Pty Ltd  
SOURCE Engineering conference: developing remote areas: Darwin 11-15 May 1987: printed papers. p 240-246

IMPRINT Barton: IEAust, 1987  
COLLATION 7 p ill 7 refs  
SERIES National Conference Publication (IEAust) no 87/1  
AB Australia is dependent on its transportation system for its welfare and cohesion. With vast distances between population centres, air transport has emerged as an essential service, particularly for more remote areas of the continent. In many cases, the development of airport facilities in remote areas occurred for reasons not directly associated with the region itself. For example, air strips were used as staging points on the England-Australia air route developed by pioneer aviators. Also, during World War II, many airports were developed for training, strategic and staging purposes. In outback areas, these airports initially played a major part in opening up their respective regions, and later contributed significantly to their growth and development. In the early days, airport facilities were relatively basic. However, with the increase in number and sophistication of aircraft, along with more stringent safety requirements, a complex infrastructure became necessary to service air transport. This required the solution of many technical and practical problems.

DE AIR TRANSPORTATION - Australia  
MINOR AVIATION - Australia; AIRPORT RUNWAYS - construction; AIRPORT RUNWAYS - design; AIRPORT RUNWAYS - bituminous; AIRPORTS

ID HISTORY; AERODROMES; OUTBACK COMMUNITIES; ROYAL FLYING DOCTOR SERVICE; TOURISM; GOVERNMENT POLICY; FLEXIBLE PAVEMENTS; RIGID PAVEMENTS; PAPUA NEW GUINEA; MALAYSIA; CHINA

000000890298

TI The role of timber bridges in the road system of Western Australia

AU PALMER=PM  
AULOC Main Roads Department, WA  
SOURCE First national structural engineering conference 1987: Melbourne 26-28 August 1987: preprints of papers. Vol 1. p 236-244

IMPRINT Barton: IEAust, 1987  
COLLATION 9 p charts 2 refs  
SERIES National Conference Publication (IEAust) no 87/10  
AB The evolution of timber bridge design in Western Australia is outlined with reference to some notable early bridges and the way in which these structures were modified to cope with changing traffic needs. Details are given of current standard construction practice with special reference to the properties of timber. Design stresses used for various timbers are tabulated, and methods used to rate bridges for vehicle load carrying capacity are briefly described. Maintenance



nance of timber bridges is discussed including the application of recent technology to extend the life of structures and techniques developed to strengthen existing structures.

DE  
MINOR BRIDGES, WOOD - design  
BRIDGES, WOOD - construction; BRIDGES, WOOD - maintenance; BRIDGES, WOOD - decks; PILES - wooden construction; CONCRETE CONSTRUCTION - applications; WOODEN CONSTRUCTION - analysis; WOODEN CONSTRUCTION - stresses; WOODEN CONSTRUCTION - shrinkage

ID HISTORY; CONVICT ERA; PUBLIC WORKS DEPARTMENT ERA; MAIN ROADS DEPARTMENT ERA; SWAN RIVER; CAUSEWAY BRIDGE; NORTH FREMANTLE BRIDGE; SUBSTRUCTURE; SUPERSTRUCTURE; SAWN TIMBER; ROUND TIMBER; REINFORCED CONCRETE DECKS; TIMBER STRINGERS

000000890264

TI Integrity and capacity of Melton viaduct  
AU GRUNDY=P; DEUTSCH=GP; HARDCASTLE=RTA; PARK=A

AULOC Monash University VLine, State Transport Authority Hardcastle and Richards Pty Ltd VLine, State Transport Authority

SOURCE First national structural engineering conference 1987: Melbourne 26-28 August 1987: preprints of papers. Vol 1. p 42-49

IMPRINT Barton: IEAust, 1987  
COLLATION 8 p ill charts 12 refs  
SERIES National Conference Publication (IEAust) no 87/10  
AB Melton viaduct, a wrought iron, lattice girder railway bridge, has been in service for 98 years. It has developed buckles in some of the bottom chords which theoretically should be in tension. A detailed review of structure with field measurements revealed that compression developed through seizure of the expansion joints and restraint of trestles coupled with temperature and live load effects, and also through the effect of the trestle tension bracing. It has been established that the buckles do not affect structural integrity. An estimate of stress history combined with the measured stresses and laboratory tests of the fatigue life of a wrought iron splice established a virtually unlimited fatigue life. With regular inspection the structure can remain in unrestricted service for the foreseeable future.

DE BRIDGES, RAILROAD - structural design; BRIDGES, RAILROAD - structural analysis

MINOR BRIDGES, RAILROAD - service life; BRIDGES, RAILROAD - expansion joints; STRUCTURAL FRAMES - buckling; STRUCTURAL DESIGN - stresses; STRUCTURAL DESIGN - loads; STRUCTURAL DESIGN - thermal effects; WROUGHT IRON - fatigue; MATERIALS TESTING - fatigue; STRESSES - analysis; STRESSES - measurements

ID WROUGHT IRON BRIDGES; IMPACT; TEMPERATURE STRESSES; HISTORY; INSPECTION; RIVETTED CONNECTIONS; FATIGUE DAMAGE CALCULATION; BRIDGE RATING; ANZRC METRIC COOPER M250 LOADING

000000890088

TI Hawken Address 1988: "Consulting in Queensland - the changing scene"

AU McINTYRE=J  
AULOC McIntyre & Associates

SOURCE Queensland Division Technical Papers. v 29, n 22, November/December 1988. p 1-7  
Brisbane: IEAust Queensland Division, 1988

IMPRINT  
COLLATION 7 p  
AB When Professor Whitmore asked me to present the 1988 Hawken Address, he suggested that a subject dealing with the history of engineering in Australia would be appropriate, since this was our bicentennial year. Having worked for the last 38 years in the private enterprise field of consulting in Queensland, and being somewhat disillusioned by the changes in practice in recent years, I chose "Consulting in Queensland - The Changing Scene" as the subject of my address.

DE ENGINEERING - professional aspects  
MINOR EMPLOYMENT - legislation; INDUSTRIAL INSURANCE; ENGINEERS - employment; ENGINEERING - computer applications

ID CONSULTING ENGINEERING; HISTORY; FIRMS; PRACTICE DEVELOPMENT; LOCAL AUTHORITY SERVICE; TRADE PRACTICES ACT 1974; ASSOCIATION OF CONSULTING ENGINEERS, AUSTRALIA; LIABILITY AND PROFESSIONAL INDEMNITY INSURANCE; WORK GENERATION; FEES; PRACTICE OVERHEADS; FUTURE TRENDS

000000890087

TI The history of the early water supply of Hobart: the first 100 years: 1804-1904

AU CRAWFORD=PG; RYAN=KA

AULOC Retired Department of Main Roads, Tasmania

IMPRINT Hobart: IEAust Tasmania Division Engineering Heritage Committee, (1988)

COLLATION 66 p ill charts 63 refs  
AB As the population of Hobart Town grew rapidly, the supply of water not only proved inadequate but deteriorated considerably in quality in the lower reaches due to pollution by both the human and animal population. Engineers were then called upon to devise a more constant supply of good quality water at various points throughout the settlement. Thus began a long period of engineering development to satisfy the ever increasing demand for good and adequate supplies of water. The authors have traced this development over the first hundred years and it is now recorded here as part of our Engineering Heritage and as a tribute to those early engineers.

DE WATER SUPPLY - Hobart  
MINOR URBAN PLANNING - water supply; WATER SUPPLY - water quality; RIVERS - diversion; RESERVOIRS - construction; DAMS, ARCH - construction; ENGINEERS - biographies

ID ENGINEERING HERITAGE; HOBART RIVULET; PIPED WATER SUPPLY; MILLES TRACK; MOUNT WELLINGTON; DEGRAVES=Peter; THE CASCADES; SANDY BAY; LOWER RESERVOIR; UPPER RESERVOIR; NORTH WEST BAY RIVER; MOUNTAIN WATER RESOURCE; KAY=William Porden

000000882290

TI Guide to Australian engineering plaquing programme

AU INSTITUTION OF ENGINEERS, AUSTRALIA. National Panel on Engineering Heritage

IMPRINT Barton: IEAust, 1988

COLLATION 15 p ill  
AB The Australian Engineering Plaquing Programme has been developed as a means of bringing deserved public recognition to historic engineering works and

sites. Programmes of this kind have been running successfully for many years in the USA under the auspices of the major engineering institutions, and have been adopted elsewhere after suitable modification to suit local needs. This document describes the scheme which has been adopted by The Institution of Engineers, Australia.

DE ENGINEERING - Australia  
MINOR ENGINEERING - conservation; SOCIETIES AND INSTITUTIONS; PUBLIC WORKS - conservation

ID HISTORY; HISTORIC ENGINEERING MARKS; NATIONAL ENGINEERING LANDMARK

000000882288

TI An historical perspective on water quality monitoring and modelling in Australia

AU LOH=IC

AULOC Water Authority of Western Australia

SOURCE Transactions of The Institution of Engineers, Australia Civil Engineering. v CE30, n 4, December 1988. p 231-252

IMPRINT Barton: IEAust, 1988

COLLATION 14 p charts 95 refs  
AB The historical development of water quality studies in Australia are discussed. Particular attention is given to the growth in water quality monitoring and modelling over the last 20 years. First order predictions of the effects of some land use changes on water quality have been carried out, however, significant limitations in our predictive capacities remain. Water quality modelling has been successful in assisting engineering project evaluation and broad scale water resource catchment planning. However, we currently cannot predict the effects of new land management strategies on water quality. While the new microelectronics era provides scope for more efficient data collection and analysis, continued reductions of resources in the water industry will seriously affect our ability to adequately tackle growing water quality problems.

DE WATER SUPPLY - water quality  
MINOR WATER RESOURCES - management; WATERSHED - analysis; WATER SUPPLY - monitoring; HYDROLOGY; RIVERS - salinity measurement; LAKES; LAND WATERWAYS; REGIONAL PLANNING - water supply

ID HISTORY; CATCHMENT SALINITY MODELLING; HYDROGRAPH RESPONSE; MURRAY RIVER SALINITY MODELLING; NUTRIENTS; SEDIMENTS; STATISTICALLY BASED RECURSIVE TIME SERIES MODELLING

000000882285

TI Flood estimation in Australia - progress to the present possibilities for the future

AU PILGRIM=DH; ROBINSON=DK

AULOC University of New South Wales

SOURCE Transactions of The Institution of Engineers, Australia Civil Engineering. v CE30, n 4, December 1988. p 187-206

IMPRINT Barton: IEAust, 1988

COLLATION 20 p charts 141 refs  
AB A broad overview of flood estimation in Australia is given. The development to the present time of flood estimation approaches and procedures is briefly reviewed. The 1987 edition of "Australian Rainfall and Runoff" represents the current state of the art, and the approaches adopted in preparing the revised edition



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ERIC sign; ublic  
FICE IING IVA-  
ush-  
tage vers.  
ID  
000000882275  
TI The building of William Sandford's Lithgow blast furnace, 1905-07  
AU REYNOLDS=DK  
AULOC Slab & Plate Products Division, BHP Steel International Group  
SOURCE Fourth national conference on engineering heritage 1988: Sydney 5-8 December 1988: preprint of papers. p 109-115  
IMPRINT Barton: IEAust, 1988  
COLLATION 7 p ill charts 5 refs  
SERIES National Conference Publication (IEAust) no 88/14  
AB In 1905, when William Sandford made his decision to design, order and build a blast furnace at Lithgow, a New South Wales country town some 150 kilometres west of Sydney, within 15 months he had embarked on a most ambitious venture. There was no Australian expertise available, and as a result his advice and expert assistance would have to come from Europe or the United States. In 1903 Sandford had engaged an English expert, Enoch James, to evaluate the economics of establishing an iron making industry at Lithgow. James had advised favourably and on that basis Sandford made his decision to build the new Lithgow furnace. It is interesting to note that when Sandford made his decision as to the final contractor Jos Harrison, and not Enoch James was chosen. Thus from the start, Sandford's task was difficult as time was his enemy. However, Sandford was a very determined entrepreneur, stood steadfastly by his goal and was determined to meet the deadline date. Unfortunately, wet weather and late overseas deliveries thwarted his ambitions.

Notwithstanding this, the new blast furnace was able to prove that iron could at last be economically produced in Australia. It was a tragedy that Sandford had to relinquish control of the works before this could be proved. It was left to Charles and George Hoskins to carry on with the challenge, and prove Sandford's point.  
DE BLAST FURNACES - construction  
MINOR BLAST FURNACES - design; BLAST FURNACES - blowers; BLAST FURNACES - electric equipment; IRON AND STEEL PLANTS - layout; IRON AND STEEL PLANTS - design; IRON AND STEEL PLANTS - foundations  
ID PLANT SUPPLY; COAL STAGE HILL; EQUIPMENT ERECTION; TURBO BLOWER; STEAM PLANT; DAVY ENGINE; COWPER STOVES; ENGINEERING HERITAGE

000000882274  
TI Pyrmont Bridge - construction and restoration  
AU TRUEMAN=EG  
AULOC Hughes Trueman Ludlow  
SOURCE Fourth national conference on engineering heritage 1988: Sydney 5-8 December 1988: preprint of papers. p 98-108  
IMPRINT Barton: IEAust, 1988  
COLLATION 11 p ill charts 8 refs  
SERIES National Conference Publication (IEAust) no 88/14  
AB This paper describes the construction of Pyrmont Bridge and the features that justified its significance, both at the time of construction and in present day terms. It also describes the investigation and restoration carried out to incorporate the bridge as an important element in the Darling Harbour Project.  
DE BRIDGES - construction  
MINOR BRIDGES, SWING; BRIDGES, STEEL; BRIDGES, WOOD; BRIDGES - design; BRIDGES - repair; BRIDGES - testing; BRIDGES - conservation; PILES - construction; BRIDGE PIERS - construction; TRUSSES - wood; WOOD PRESERVATION  
ID ENGINEERING HERITAGE; HISTORY; SWING SPAN SUPERSTRUCTURE; SWING SPAN DRIVE; PRESERVATION TECHNIQUES

000000882273  
TI W.J. Hancock, engineer and pioneer radiographer  
AU MOYNIHAN=JF  
AULOC Telecom Australia, Western Australia  
SOURCE Fourth national conference on engineering heritage 1988: Sydney 5-8 December 1988: preprint of papers. p 92-97  
IMPRINT Barton: IEAust, 1988  
COLLATION 6 p ill 48 refs  
SERIES National Conference Publication (IEAust) no 88/14  
AB The paper is a biography of William John Hancock, Western Australia's first Superintendent of Telephones and that State's first radiographer. Hancock was involved in early telephone installations in WA, after which he practised electrical engineering for 27 years. He built the first X-Ray plant in WA, and was Honorary Radiographer at Royal Perth Hospital for 22 years. For his various activities he was honoured both before and after his death in 1931.  
DE ENGINEERS - biographies  
MINOR ELECTRICAL ENGINEERING; TELECOMMUNICATION SYSTEMS; TELEPHONE SYSTEMS; TELEGRAPH SYSTEMS; RADIOGRAPHY; X-RAY

LABORATORIES; ENGINEERING EDUCATION  
INSTITUTION OF ENGINEERS, AUSTRALIA  
ID  
000000882272  
TI Early concrete structures in New Zealand  
AU THORNTON=GG  
AULOC New Zealand Historic Places Trust  
SOURCE Fourth national conference on engineering heritage 1988: Sydney 5-8 December 1988: preprints of papers. p 86-91  
IMPRINT Barton: IEAust, 1988  
COLLATION 6 p ill 14 refs  
SERIES National Conference Publication (IEAust) no 88/14  
AB Use of concrete in New Zealand dates from the 1840s. It was widespread and not restricted to professionals. Houses were surprisingly common by the 1870s. Civil engineering uses were more restricted than buildings until the advent of reinforced concrete. There was at least one four storey building in mass concrete. Virtually all examples described in the paper are extant. One of the commonest engineering uses of mass concrete was in bridge piers and abutments. It was used also in breakwaters, tunnel linings, block construction for a lighthouse, and dams. After 1900 it gave way to reinforced concrete in multistorey buildings, bridges, wharves, water towers, hydroelectric stations and aircraft hangars. Early concrete buildings were considered resistant to fire and earthquake. Paucity of other materials and also masons encouraged use of the new material. Proven resistance of reinforced concrete to seismic forces gave considerable impetus to its widespread adoption. Today the New Zealand Historic Places Trust is identifying and classifying many concrete structures as worthy of preservation as part of our engineering heritage.  
DE CONCRETE CONSTRUCTION - New Zealand  
MINOR CIVIL ENGINEERING - materials; CONCRETE CONSTRUCTION - reinforced concrete; BUILDINGS - concrete; BREAKWATERS - concrete construction; CHURCHES - concrete; BRIDGES, CONCRETE; WATER TANKS AND TOWERS - concrete construction  
ID ENGINEERING HERITAGE; OAMARU BREAKWATER; GRAFTON BRIDGE; TRENTHAM RACECOURSE; FW PETRE'S DOMINICAN PRIORY; GLENMARK STATION

000000882271  
TI Fire protection in historic buildings: the work of the Fire Advisory Panel  
AU PHILLIPS=OP  
AULOC Orwell & Peter Phillips Architects  
SOURCE Fourth national conference on engineering heritage 1988: Sydney 5-8 December 1988: preprint of papers. p 81-85  
IMPRINT Barton: IEAust, 1988  
COLLATION 5 p charts 8 refs  
SERIES National Conference Publication (IEAust) no 88/14  
AB The Fire Advisory Panel of the Heritage Council of New South Wales brings together representatives from the professions, the regulatory authorities, and the fire protection industry. Its purpose is to advise on appropriate fire protection measures for historic buildings which will provide an adequate level of fire safety but have the minimum effect on the significant fabric of the building. The paper includes examples of the Panel's work relating both to specific buildings (including the



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The first Sydney/Brisbane steamship service  
WHITMORE=RL  
CE Queensland Division Technical Papers. v 27, n 16,  
June-July 1986. p 1-6  
INT Brisbane: IEAust Queensland Division, 1986  
ATION 6 p ill charts 23 refs  
Although the social contribution of the coastal steam-  
ship service to Australia's development has received  
some consideration, an assessment of the technologi-  
cal significance of the ships appears to have been  
largely ignored. The paper examines the technology of  
the ships which inaugurated the Sydney to Brisbane  
service in the early 1840s, and assesses their contri-  
bution to the development of Australian engineering.  
STEAMSHIPS  
R STEAM ENGINES - applications; TECHNOLOGY -  
economic and sociological effects; STEAMSHIPS -  
construction; STEAMSHIPS - design; SHIPBUILD-  
ING; MARINE ENGINEERING  
HISTORY; ENGINEERING HERITAGE; SHAMROCK;  
KING WILLIAM THE FOURTH; SOVEREIGN; PIO-  
NEERSHIPS; PADDLE STEAMERS; QUEENSLAND;  
NEW SOUTH WALES

00871197

The first sixty years of metal bridges in New South  
Wales  
FRASER=DJ  
C University of New South Wales  
CE Transactions of The Institution of Engineers, Australia:  
Multi-Disciplinary Engineering. v GE10, n 1, June  
1986. Paper G1182. p 44-52  
NT Barton: IEAust, 1986  
ATION 12 p ill charts 18 refs  
The history of the first sixty years of metal bridges in  
New South Wales had two distinct phases, the British  
period 1863-92 and the American period thereafter.  
The principal type of bridge was different in each  
period, the shallow girder in the former and the tall truss  
in the latter. There were advantages and disadvan-  
tages with each type, but by the beginning of the  
twentieth century, engineers had decided on the most  
suitable application for each. This paper traces the  
technical and non-technical factors that influenced  
bridge engineering in New South Wales from 1863 to  
1923.  
BRIDGES, HIGHWAY - design; BRIDGES, RAIL-  
ROAD - design  
BRIDGES, WOOD; BRIDGES, HIGHWAY - construc-  
tion; BRIDGES, HIGHWAY - costs; BRIDGES, RAIL-  
ROAD - construction; BRIDGES, RAILROAD - costs;  
TRUSSES; BEAMS AND GIRDERS; BRIDGES, MOV-  
ABLE; ENGINEERS; BRIDGES - New South Wales  
ENGINEERING HERITAGE; BRITISH BRIDGES;  
CELLULAR GIRDERS; WARREN GIRDERS; WAR-  
REN TRUSSES; LATTICE GIRDERS; LATTICE  
TRUSSES; PLATE WEB GIRDERS; ROBERT  
STEPHENSON; CONWAY; BRITANNIA; VICTORIA;  
TUBULAR BRIDGES; MENANGLE; PENRITH;  
WOLLONDILLY; PRINCE ALFRED BRIDGE;  
TOWNSEND=GW; AMERICAN BRIDGES; PRATT  
TRUSSES; MORREL=GA

10871191

Coke oven technology in the Ipswich area  
WHITMORE=RL; BILLING=G

AULOC Institution of Engineers, Australia. Queensland Divi-  
sion. Heritage Panel Queensland Electricity Commis-  
sion  
SPONSORS Australian Heritage Commission  
SOURCE Transactions of The Institution of Engineers, Australia:  
Multi-Disciplinary Engineering. v GE10, n 1, June  
1986. Paper G1178. p 7-12  
IMPRINT Barton: IEAust, 1986  
COLLATION 6 p ill charts 7 refs  
AB A coking industry existed in North Ipswich for over a  
hundred years, during which period its technology  
remained practically unchanged. The history of the  
industry is traced, its technology is discussed, and the  
relics remaining from it are described.  
DE COKE OVENS; COKE MANUFACTURE  
MINOR COKE OVENS - design; COKE OVENS - construc-  
tion; COKE OVENS - brick construction; FURNACES,  
INDUSTRIAL; TECHNOLOGY; COAL PREPARATION  
HISTORY; GULLAND=James; OLD TIVOLI PIT;  
WRIGHT=John; ECLIPSE; KELLETT=William;  
REDBANK; JOHNSON=John; WATERSTOWN; STAF-  
FORD BROTHERS; ROTHWELL HAIGH; HAIGMOOR;  
BLACK=William; SAINT-SMITH=EC; KLONDYKE  
COLLIERY; COKE BURNERS; ABERMAIN;  
WRIGHT'S PATENT OVENS; ENGINEERING HER-  
ITAGE; QUEENSLAND; BEEHIVE TYPE

000000871190

TI The first Sydney/Brisbane steamship service  
AU WHITMORE=RL  
AULOC Institution of Engineers, Australia. Queensland Divi-  
sion. Heritage Panel  
SOURCE Transactions of The Institution of Engineers, Australia:  
Multi-Disciplinary Engineering. v GE10, n 1, June  
1986. Paper G1177. p 1-6  
IMPRINT Barton: IEAust, 1986  
COLLATION 6 p charts 23 refs  
AB Although the social contribution of the coastal steam-  
ship service to Australia's development has received  
some consideration, the assessment of the technologi-  
cal significance of the ships appears to have been  
largely ignored. The paper examines the technology of  
the ships which inaugurated the Sydney to Brisbane  
service in the early 1840s, and assesses their contri-  
bution to the development of Australian engineering.  
STEAMSHIPS  
DE STEAMSHIPS - design; STEAMSHIPS - constructing  
MINOR and outfitting; STEAM ENGINES - design; STEAM  
ENGINES - construction; STEAMSHIPS - boilers;  
SHIP PROPULSION - steam; SHIP PROPULSION -  
paddle wheels; TECHNOLOGY - economic and socio-  
logical effects; MARINE ENGINEERING; SHIPBUILD-  
ING  
ID HISTORY; ENGINEERING HERITAGE; PADDLE  
STEAMERS; MORETON BAY; SHAMROCK;  
PATERSON=William; SOVEREIGN; BOULTON &  
WATTS SOHO FOUNDRY; HUNTER RIVER STEAM  
NAVIGATION COMPANY; PYRMONT; MELBOURNE;  
WILLIAM THE FOURTH; KING WILLIAM THE  
FOURTH

000000870617

TI Descriptive list of papers and photographs held in the  
archives of The National Headquarters Canberra  
AU INSTITUTION OF ENGINEERS, AUSTRALIA  
IMPRINT Barton: IEAust, 1983  
COLLATION 26 p

DE INSTITUTION OF ENGINEERS, AUSTRALIA  
ID HISTORY; ENGINEERING HERITAGE; OFFICIAL  
DOCUMENTS; CONFERENCES; AGM MICHELL  
PROJECT; COLLECTIONS; FILES; PHOTOGRAPHS;  
MINUTES; FINANCIAL STATEMENTS; MISCELLA-  
NEOUS PAPERS; ENGINEERING ASSOCIATION  
OF NEW SOUTH WALES; LIBRARY

000000870586

TI 59th Annual report 1985  
AU INSTITUTION OF ENGINEERS, AUSTRALIA. Can-  
berra Division  
IMPRINT (Barton?): (IEAust Canberra Division), 1986  
COLLATION (8) p + balance sheet ill  
DE INSTITUTION OF ENGINEERS, AUSTRALIA. Can-  
berra Division  
MINOR ENGINEERING EDUCATION; ENGINEERING - pub-  
lic policy; BUDGET CONTROL; ENGINEERING - pro-  
fessional aspects  
ID AWARDS; PURKISS=AE; ENGINEERING HERIT-  
AGE

000000870573

TI Newcastle Division Institution of Engineers, Australia:  
chairman's report  
AU GILFORD=D  
SOURCE Engineers Newcastle Division. Newcastle Division in-  
sert, The Journal of The Institution of Engineers Aus-  
tralia. v 58, n 1, January 24, 1986. p 2-3  
IMPRINT St Leonards: Miadna, 1986  
COLLATION 2 p  
DE INSTITUTION OF ENGINEERS, AUSTRALIA. New-  
castle Division  
MINOR ENGINEERING - professional aspects; ENGINEER-  
ING - public policy  
ID AWARDS; BRIDGE=Russell; ENGINEERING HERIT-  
AGE; BICENTENNIAL COMMITTEE;  
BEVERLEY=Grahame; PINZONE=Tom; PROFES-  
SIONAL ENGINEERS WEEK; CRIPPS=Jerrold; ELEC-  
TRIC ENERGY CONFERENCE 1985; CHAIRMAN'S  
DAY

000000870541

TI History of public works being compiled  
SOURCE The Journal of The Institution of Engineers Australia. v  
58, n 1, January 24, 1986. p 12  
IMPRINT St Leonards: Miadna, 1986  
COLLATION 5 pars  
DE PUBLIC WORKS - New South Wales  
ID ENGINEERING HERITAGE; NEW SOUTH WALES.  
Department of Public Works

000000870531

TI Historic engineering marker: the Furphy water cart  
SOURCE The Journal of The Institution of Engineers Australia. v  
58, n 1, January 24, 1986. p 10  
IMPRINT St Leonards: Miadna, 1986  
COLLATION 1 par ill  
DE WATER TANKS AND TOWERS  
MINOR AGRICULTURAL MACHINERY; AGRICULTURAL EN-  
GINEERING; PATENTS AND INVENTIONS  
ID PLAQUES; JOHN PICK RESERVE; SHEPPARTON;  
FURPHY=J; ENGINEERING HERITAGE; INSTITU-  
TION OF ENGINEERS, AUSTRALIA

000000870407

TI Dams and dam failures, a review  
AU JOY=CS



DE president of the Student Representative Council at  
ID Sydney University, founded the student newspaper  
'Honi Soit', and was the first honorary secretary and  
later president of Convocation, an association of Syd-  
ney University graduates. Now 81, Gosper enjoys  
recalling the early days of his career, and he describes  
in this article some of the interesting, and humorous,  
events of his career.  
ENGINEERS; ENGINEERING  
GOSPER, Murray; INSTITUTION OF ENGINEERS,  
AUSTRALIA; HISTORY; UNIVERSITY OF SYDNEY

000000857162

TI Composite bridge under threat  
SOURCE The Journal of The Institution of Engineers Australia. v  
57, n 11, June 14, 1985. p 30  
IMPRINT St Leonards: Miadna, 1985  
COLLATION 13 pars ill  
DE BRIDGES - structural design  
MINOR BRIDGES - decks; BRIDGES - models; BEAMS AND  
GIRDERS - steel; CONCRETE CONSTRUCTION;  
ROADS AND STREETS - widening  
ID TASMANIA. Department of Main Roads; GAGGIN,  
Ivan; VINCES RIVULET BRIDGE; HOBART; KING-  
STON; KNIGHT, Sir Alan; TASMANIA. Public Works  
Department; ENGINEERING HERITAGE; HISTORY

000000857095

TI The role of Government in the conservation of engi-  
neering heritage  
AU DORING=MJ  
AULOC NSW Department of Environment & Planning  
SOURCE Second National Conference on Engineering Heritage:  
The value of engineering heritage. Melbourne 20-22  
May 1985. Preprints of papers.  
Barton: IEAust, 1985  
IMPRINT 6 p  
COLLATION National Conference Publication (IEAust) no 85/3  
SERIES Current New South Wales legislation can be used to  
AB protect some types of engineering heritage items, but  
the nature of the items and lack of recognition of their  
engineering heritage value makes the task difficult.  
Nevertheless, the Heritage Council of New South  
Wales has acted to conserve a number of items of the  
engineering heritage, and some examples are de-  
scribed.  
DE CONSERVATION - legislation  
MINOR ENGINEERING - professional aspects; BUILDINGS -  
protection; BRIDGES - protection  
ID NATIONAL TRUST OF AUSTRALIA (NSW). Industrial  
Archaeology Committee; HERITAGE COUNCIL OF  
NEWSOUTH WALES; NEWSOUTH WALES; HERIT-  
AGE ACT; CLASSIFICATION

000000857094

TI Economical preservation of places of engineering her-  
itage  
AU BUTCHER=PJ  
AULOC Rooney and Bye (Aust.) Pty. Ltd., Sydney  
SOURCE Second National Conference on Engineering Heritage:  
The value of engineering heritage. Melbourne 20-22  
May 1985. Preprints of papers. p 1-3  
Barton: IEAust, 1985  
IMPRINT 3 p charts 2 refs  
COLLATION National Conference Publication (IEAust) no 85/3  
SERIES A method is presented whereby places of engineering  
AB heritage can be preserved economically. This would

enable the preservation and promotion of public under-  
standing of Australian Engineering Heritage through  
the creation of commercially operated tourist attrac-  
tions.  
DE CONSERVATION - planning  
MINOR CONSERVATION - economics; WATER TANKS AND  
TOWERS; RESERVOIRS; BUILDINGS  
ID WALKA WATERWORKS; NEW SOUTH WALES;  
BURRA CHARTER

000000857093

TI Engineering heritage with reference to mining  
AU DAVEY=CJ  
AULOC Royal Melbourne Institute of Technology  
SOURCE Second National Conference on Engineering Heritage:  
The value of engineering heritage. Melbourne 20-22  
May 1985. Preprints of papers. p 4-8  
Barton: IEAust, 1985  
IMPRINT 5 p 15 refs  
COLLATION National Conference Publication (IEAust) no 85/3  
SERIES The banning of mining on sites containing historic  
AB mining relics is creating conflict between government  
heritage legislation and mining engineering. The nature  
of engineering heritage is illustrated by mining tradi-  
tions, and shows that present heritage legislation is  
often actually destroying true heritage. Current poor  
historical method, results in a failure to properly inter-  
pret relics. Because they understand their heritage,  
engineers should be involved in the assessment and  
management of relics associated with that heritage.  
DE MINES AND MINING; CONSERVATION - planning  
MINOR MINING ENGINEERING - professional aspects; CON-  
SERVATION - legislation  
ID HISTORY

000000857092

TI The Royal Engineers in colonial Tasmania  
AU MacFIE=PH  
AULOC National Parks and Wildlife Service, Tasmania  
SOURCE Second National Conference on Engineering Heritage:  
The value of engineering heritage. Melbourne 20-22  
May 1985. Preprints of papers. p 9-15  
Barton: IEAust, 1985  
IMPRINT 7 p 65 refs  
COLLATION National Conference Publication (IEAust) no 85/3  
SERIES The Royal Engineers and Ordnance supervised con-  
AB struction, supplied hardware, and kept account of  
convict and military structures, including hospitals and  
prisons, in Tasmania between 1836 and 1871. Fortifi-  
cations were also their responsibility. The treatment of  
prisoners underwent considerable change during the  
period. With accompanying military accommodation,  
their buildings were distributed throughout the island.  
The Royal Engineers conflicted with civil authorities  
including lieutenant governors. This resulted from dif-  
fering views between the R.E.'s and prison administra-  
tors over the employment and housing of convicts. The  
pragmatic approach of the R.E.'s believed convict  
policy wasteful, and expressed their views to the Board  
of Ordnance, London. Conflict occurred between the  
R.E.'s and other "lesser" ranks and regiment. Housing  
an aging ex- convict prisoner, pauper and insane  
population also required their planning and repair skills.  
The buildings inherited by the Tasmanian Government  
formed the basis of social welfare policy, some being  
in use today. Increased anxiety over foreign intrusion  
caused the R.E.'s to design harbour fortifications and

DE defences for the new colonial volunteer force.  
MINOR BUILDINGS - construction  
HOUSES - planning; HOSPITALS - planning; MILI-  
TARY ENGINEERING; CIVIL ENGINEERING  
ID UNITED KINGDOM. Royal Engineers; HIST  
TASMANIA

000000857091

TI Nineteenth Century engineering societies  
AU HAAS=AR  
AULOC Royal Melbourne Institute of Technology  
SOURCE Second National Conference on Engineering Heri-  
The value of engineering heritage. Melbourne  
May 1985. Preprints of papers. p 16-20  
Barton: IEAust, 1985  
IMPRINT 5 p 34 refs  
COLLATION National Conference Publication (IEAust) no 85/3  
SERIES During the 1850s, several attempts were made  
AB Victoria, and in one instance in South Australia  
to establish societies having a connection with engi-  
neering, but these early efforts were not successful. At  
this, many engineers maintained a relationship with  
the Royal Society of Victoria in the decades after  
1850s. Several of these early societies had a mem-  
ber ship which included architects, surveyors and  
engineers. After the establishment of the Engineer-  
ing Association of New South Wales in 1870 and the  
Victorian Institute of Engineers in 1883, engineer-  
ing societies began to proliferate, and by World War I  
some Australian states had several societies. In  
1919, most of these societies amalgamated to form the  
Institution of Engineers, Australia.  
DE SOCIETIES AND INSTITUTIONS  
MINOR ENGINEERING - professional aspects; SURVEYING  
ARCHITECTURE; ENGINEERS  
ID HISTORY

000000857090

TI The education of Australian engineers who achieved  
eminence before 1940  
AU FERGUSON=JM  
AULOC Department of Mechanical Engineering, Gordon  
Institute of Technology, Geelong  
SOURCE Second National Conference on Engineering Heri-  
The value of engineering heritage. Melbourne  
May 1985. Preprints of papers. p 21-24  
Barton: IEAust, 1985  
IMPRINT 4 p 20 refs  
COLLATION National Conference Publication (IEAust) no 85/3  
SERIES Most nineteenth century engineers did not attend  
AB a structured course at a university or college. How-  
ever those who achieved eminence did study mathematics  
and basic engineering science by various means.  
They practised continuing education throughout their  
careers. Several common factors in their personal  
development are discussed. They developed business  
skills, and were able to grasp the financial realities  
of their engineering activities. They did not confine  
themselves to one specialised branch of engineering.  
They kept themselves informed, interested and they  
were active over a wide field of engineering. They en-  
dured the work situation at an early age, and this  
accounted for their feeling for their industry (the  
engineering), their sound engineering judgement in  
later life, and their good record in industrial rela-



ID FIBRE; AUSTRALIA. Department of Defence. Aeronautical Research Laboratory; HISTORY

**000000856395**  
TI Sugar cane harvesting in Australia  
AU MULKEARNS=LJ  
AULOC Versatile Toft Ltd., Bundaberg, Qld  
SOURCE Conference on Agricultural Engineering 1984. Agricultural Engineering Innovation. Bundaberg, Queensland 27-30 August 1984. Preprints of Papers. p 123-125  
IMPRINT Barton: IEAust, 1984  
COLLATION 3 p charts 2 refs  
SERIES National Conference Publication (IEAust) no 84/6  
AB The Australian sugar industry has progressed to 100% mechanisation in the area of harvesting. An analysis of selected industry figures suggests that the establishment of harvesters in the total picture is completely out of balance. The only alternative is to reduce production costs by utilising high technology equipment more efficiently.

DE SUGAR CANE - harvesting  
MINOR AGRICULTURAL MACHINERY - design; AGRICULTURAL MACHINERY - costs; AGRICULTURAL MACHINERY - efficiency  
ID HISTORY; QUEENSLAND

**000000855590**  
TI Generation and distribution in the outback of Western Australia  
AU PERRY=RJ  
AULOC State Energy Commission of Western Australia  
SOURCE Electric Energy Conference 1984. Low Fault Level Systems. Perth 7-9 May 1984. Preprint of Papers. p 72-85  
IMPRINT Barton: IEAust, 1984  
COLLATION 14 p charts  
SERIES National Conference Publication (IEAust) no 84/4  
DE DIESEL ELECTRIC POWER PLANTS  
MINOR ELECTRIC POWER GENERATION; DIESEL ENGINES; ELECTRIC POWER DISTRIBUTION  
ID HISTORY; RURAL REGIONS

**000000855575**  
TI The role of professional engineers in heritage conservation  
AU DAVIS=BW  
AULOC University of Tasmania  
SOURCE Civil College Technical Report. Supplement to The Journal of The Institution of Engineers Australia. v 56, n 2, February 10, 1984. p 1-4  
IMPRINT St Leonards: Miadna, 1984  
COLLATION 4 p  
AB Australians are becoming increasingly aware of, and concerned about, their natural, built and cultural environment. All levels of government are attempting to devise site registers, funding schemes and technical standards for heritage conservation, but some operational problems exist, and a learning process is occurring. Professional engineers are uniquely placed to affect heritage values through development control, the siting of public works, resource exploitation decisions, restoration projects and other assignments which affect sites and buildings. There is a need for professional engineers to develop greater awareness and expertise about heritage conservation, and to incorporate such information into design procedures and decision processes. The Australian Heritage Commission

sion would be willing to co-operate with the Institution of Engineers, Australia in developing appropriate educational programs about heritage conservation.

DE ENGINEERING - professional aspects  
ID HISTORY; AUSTRALIAN HERITAGE COMMISSION; INSTITUTION OF ENGINEERS, AUSTRALIA.

**000000855574**  
TI Coke oven technology in the Ipswich area  
AU WHITMORE=RL; BILLING; G  
AULOC Mining and Metallurgical Engineering, University of Queensland  
SOURCE The Engineering Conference 1984. Brisbane, 2-6 April 1984. Conference Papers. p 1-6  
IMPRINT Barton: IEAust, 1984  
COLLATION 6 p ill charts 6 refs  
SERIES National Conference Publication (IEAust) no 84/1  
AB A coking industry, based on the simplest design of beehive oven, existed at North Ipswich in Queensland for over one hundred years. During this period the technology of production remained practically unchanged instead of following world trends in development. The history of the industry is traced, its technology is discussed, and the relics remaining from it are described.

DE COKE OVENS - structural design  
MINOR COKE - metallurgical; COKE MANUFACTURE; ORE TREATMENT - smelting; COAL PREPARATION  
ID OLD TIVOLI PIT; ROTHWELL HAIGH; ABERMAIN; ECLIPSE; HAIGHMOOR; KONDYKE; IPSWICH; QUEENSLAND; ENGINEERING HERITAGE

**000000855573**  
TI The Burra mine and smelter  
AU CUMMING=DA  
AULOC Civil Engineering, University of Adelaide  
SOURCE The Engineering Conference 1984. Brisbane, 2-6 April 1984. Conference Papers. p 7-12  
IMPRINT Barton: IEAust, 1984  
COLLATION 6 p ill charts 24 refs  
SERIES National Conference Publication (IEAust) no 84/1  
AB The technical and economic history, and the social context of the copper mine and smelter at Burra are described as examples of engineering heritage, which can help explain to non-engineers some of the context and significance of engineering.

DE COPPER MINES AND MINING  
MINOR COPPER SMELTING; MINE SHAFTS - structural design; COPPER MINES AND MINING - steam engines; RAILROAD TRANSPORTATION; MINING ENGINEERING; COAL MINES AND MINING - economics; ENGINEERS  
ID BURRA; SOUTH AUSTRALIA; NAPIER PATENT

**000000855572**  
TI George Barney re (1792-1862), first colonial engineer  
AU SUTTON=R  
AULOC Army Museum, Victoria Barracks, New South Wales  
SOURCE The Engineering Conference 1984. Brisbane, 2-6 April 1984. Conference Papers. p 13-17  
IMPRINT Barton: IEAust, 1984  
COLLATION 5 p ill chart 9 refs  
SERIES National Conference Publication (IEAust) no 84/1  
AB George Barney was one of Australia's pioneer engineers. Between 1835 and 1860, he designed and supervised the construction of many important colonial engineering works such as Circular Quay, Victoria

Barracks and Fort Denison. After an outline of his training, his works are described to show his contribution to Australia's engineering heritage.

DE ENGINEERS - Biographies  
MINOR MUNICIPAL ENGINEERING; ENGINEERING CATION; ARCHITECTURE  
ID HISTORY; BUSBY'S BORE; NEWCASTLE BFWATER; NEW SOUTH WALES; WOLLONG BARNEY, George

**000000855571**  
TI Railway lattice girder bridges in New South Wales  
AU BEST=RE; FRASER=DJ;  
AULOC Bridges and Structures, State Rail Authority of South Wales Civil Engineering, The University of South Wales  
SOURCE The Engineering Conference 1984. Brisbane, 2-1984. Conference Papers. p 18-23  
IMPRINT Barton: IEAust, 1984  
COLLATION 6 p ill charts 22 refs  
SERIES National Conference Publication (IEAust) no 84/1  
AB Twelve railway lattice girder bridges were constructed in New South Wales between 1870 and 1887. They represented the first major programme of iron construction, and were vital components of the expanding railway network. The engineering works are described, and the relevant historical information summarised.

DE BRIDGES, RAILROAD - structural design  
MINOR CIVIL ENGINEERING; BEAMS AND GIRDERS; AND ALLOYS - structural; TRUSSES  
ID HISTORY; ENGINEERING HERITAGE; NEW SOUTH WALES

**000000855564**  
TI Engineering heritage and the local government engineer  
AU CAFE=DR  
AULOC Municipality of Woollahra, NSW  
SOURCE The Engineering Conference 1984. Brisbane, 2-1984. Conference Papers. p 51-54  
IMPRINT Barton: IEAust, 1984  
COLLATION 4 p 8 refs  
SERIES National Conference Publication (IEAust) p 84/1  
AB This paper describes briefly several typical projects undertaken by a Local Government Engineer in heritage issues need to be addressed. These include the restoration of sandstone kerbing and gutter drainage structures, the retention of disused buildings or parts thereof such as sandstone footings, and coastal gun emplacements in park development programmes. The importance of recognising heritage issues in Local Government Engineering practice is appraised.

DE MUNICIPAL ENGINEERING - project manager  
MINOR ROADS AND STREETS - curbs; ROADS STREETS - drainage; URBAN PLANNING; ENVIRONMENTAL PROTECTION; CONSERVATION RECREATION CENTERS - construction; FOUNDATIONS  
ID KERBS; WOOLLAHRA; GAP PARK; SIGNAL RESERVES; CANONBURY PARK; SYDNEY; SOUTH WALES; CENTRES

**000000855563**  
TI The Glen Osmond Mines - a national engineering heritage



DE ENGINEERING - Canberra  
MINOR ROADS AND STREETS; BRIDGES; HIGHWAY EN-  
GINEERING; RAILROADS; TRANSPORTATION;  
LAKES; DAMS; RESERVOIRS; WATER RE-  
SOURCE; ELECTRIC POWER SYSTEMS; ELEC-  
TRIC LIGHTING; NATURAL GAS PIPELINES;  
TELECOMMUNICATION SYSTEMS; TELEPHONE  
SYSTEMS; MILITARY ENGINEERING; ENGINEER-  
ING EDUCATION; AVIATION; AEROSPACE  
GROUND SUPPORT  
ID INSTITUTION OF ENGINEERS, AUSTRALIA. Can-  
berra Division; ENGINEERING HISTORY

000000854025

TI How to look at bridges. A guide to the study of  
Australian historic bridges  
AU O'CONNOR=C  
AULOC Institution of Engineers, Australia. National Engineer-  
ing Heritage Panel  
SPONSORS Australian Heritage Commission  
IMPRINT Barton: IEAust, 1983  
COLLATION 5 p ill.  
AB After an introductory look at some old bridges, this  
booklet classifies bridges into their various types, and  
illustrates particular features of these types by refer-  
ence to Australian bridges. It concludes by listing the  
information that is desirable in describing a bridge, and  
advice as to how this information may be recorded.  
DE BRIDGES  
MINOR BRIDGES, HIGHWAY; BRIDGES, RAILROAD;  
BRIDGES, MASONRY; BRIDGES, WOOD; BRIDGES,  
STEEL; BRIDGES, CONCRETE; BRIDGES, MOV-  
ABLE  
ID ENGINEERING HERITAGE; ENGINEERING HIS-  
TORY; INSTITUTION OF ENGINEERS, AUSTRALIA.  
National Panel for Engineering Heritage; AUSTRAL-  
IAN HERITAGE COMMISSION

000000854024

TI Shaping the Hunter: a story of engineers, and the  
engineering contribution to the development of the  
present shape of the Hunter Region...  
AU ARMSTRONG=J  
IMPRINT Newcastle: IEAust Newcastle Division, 1983  
COLLATION 192 p ill.  
DE ENGINEERING - Hunter Valley  
MINOR PORTS AND HARBOURS; COAL MINES AND MIN-  
ING; SHIPBUILDING; ROADS AND STREETS; HIGH-  
WAY ENGINEERING; RAILROADS; INDUSTRIAL  
ENGINEERING; WATER RESOURCES; ELECTRIC  
POWER SYSTEMS; MUNICIPAL ENGINEERING;  
IRON AND STEEL PLANTS  
ID NEWCASTLE; INSTITUTION OF ENGINEERS, AUS-  
TRALIA. Newcastle Division ENGINEERING HIS-  
TORY; ENGINEERING HERITAGE

000000853844

TI The nature of the engineering heritage  
AU WHITMORE=RL  
AULOC Mining and Metallurgical Engineering, University of  
Queensland  
SOURCE The Protection of the engineering heritage. Brisbane,  
9-12 May 1982. Preprints of papers. p 1-3  
IMPRINT Barton: IEAust, 1982  
COLLATION 3p 5 refs  
SERIES National Conference Publication (IEAust) no 82/2  
AB After a brief review of the background to the develop-

ment of the engineering heritage in Australia, its ele-  
ments are identified as: personalities, documentation  
and artefacts. The degrees and type of protection  
required by, and afforded to, each element are exam-  
ined, and the major hazards which they faced are  
discussed. Measures which are urgently required to  
place the engineering heritage on a sound basis are  
indicated.

DE ENGINEERING - history  
MINOR ENGINEERS  
ID ENGINEERING HERITAGE; AUSTRALIA; AR-  
CHIVES; INSTITUTION OF ENGINEERS, AUS-  
TRALIA. NATIONAL PANEL FOR ENGINEERING  
HERITAGE; INDUSTRIAL ARCHAEOLOGY

000000853843

TI The place of government in protecting the engineering  
heritage - a look at Australian and overseas examples.  
AU BOURKE=M  
AULOC Australian Heritage Commission, Canberra  
SOURCE The Protection of the Engineering Heritage. Brisbane,  
9-12 May 1982. Preprints of Papers. p 4-7  
IMPRINT Barton: IEAust, 1982  
COLLATION 4p 10 refs  
SERIES National Conference Publication (IEAust) no 82/2  
AB In virtually all developed countries of the western world,  
interest in conserving and understanding physical  
objects associated with engineering and industry is at  
a very high level. In most countries governments have  
responded to this interest in a variety of ways involving  
research, grants, legislation, physical protection. In  
Australia, the Commonwealth Government and some  
State governments have responded to initiatives from  
private citizens and organisations, including engineers,  
to tackle a number of the questions involved in the  
protection of the engineering heritage. This paper  
describes some of these responses in Australia, North  
America and in Europe.  
DE ENGINEERING - history  
MINOR NATIONAL ESTATE; NATIONAL TRUST; ENGINEER-  
ING HERITAGE; GOVERNMENT; INSTITUTION OF  
ENGINEERS, AUSTRALIA; COMMONWEALTH; IN-  
DUSTRIAL ARCHAEOLOGY; ENGINEERING HER-  
ITAGE

000000853842

TI Engineering heritage activities within the Defence  
Research Centre Salisbury  
AU LANGFORD=AFW  
AULOC Mechanical Engineering Design, Department of De-  
fence, Salisbury  
SOURCE The Protection of the engineering Heritage. Brisbane,  
9-12 May 1982 Preprints of Papers. p 8-11  
IMPRINT Barton: IEAust, 1982  
COLLATION 4 p ill.  
SERIES National Conference Publication (IEAust) no 82/2  
AB This paper presents a brief history of the Establishment  
and its background. It reviews the activities to establish  
a permanent exhibition which began in 1965, but did not  
eventuate. These activities continued sporadically until  
1975 when the Adelaide Division of the Institution set  
up its Sub-committee on Historical Engineering Relics.  
An enthusiast was appointed as the Establishment  
Liaison Officer to this sub-committee and was asked to  
convene an internal 'museum' committee. By 1978  
when he had to resign from both positions due to  
pressure of work, he had carried out a survey to

discover items of interest to display in a museum  
had not convened a meeting of the committee  
paper describes the developments and achieve-  
in the period from March 1978 to the present, whi-  
author was the Chairman of the Museum Comr  
and the Liaison Officer to the Institution Comr  
The future is briefly discussed, and some of the le-  
learned by the author are described in the concl  
ENGINEERING - history  
MINOR MILITARY ENGINEERING; MILITARY EQUIPW  
MUSEUMS; ROCKETS AND MISSILES  
ID DEFENCE RESEARCH CENTRE SALISBURY; C  
MONWEALTH; INDUSTRIAL ARCHAEOLOGY  
GINEERING HERITAGE

000000853841

TI The Tasmanian engineering heritage  
AU McFIE=HH  
AULOC The Hydro Electric Commission, Tasmania  
SOURCE The Protection of the Engineering Heritage. Bris  
9-12 May 1982. Preprints of Papers. p 12-23.  
IMPRINT Barton: IEAUST, 1982  
COLLATION 12 p ill. 26 refs  
SERIES National Conference Publication (IEAust) no 82  
AB A resume of the establishment of the Tasm  
Committee for Engineering Heritage (the Comr  
of The Institution of Engineers Australia, and its  
gramme to research, record and preserve site  
objects of engineering significance is presented  
wide variety and extent of the Tasmanian Engine  
Heritage is briefly described, together with some e  
ples of military engineering, public works (roads, br  
and railways), mining, power generation, manufi  
ing and muncpal services. The paper conclude  
the task facing the Committee is both a formidabl  
long term one, for which regular funding at a subst  
level is required.  
DE ENGINEERING - history  
MINOR MILITARY ENGINEERING; ROADS AND STRE  
BRIDGES; RAILROADS; MINES AND MINING  
DROELECTRIC POWER PLANTS; MUNICIPAL  
GINEERING; INDUSTRIAL PLANTS;  
ID TASMANIAN COMMITTEE FOR ENGINEERING  
ITAGE; INSTITUTION OF ENGINEERS, AUSTR  
NATIONAL PANEL FOR ENGINEERING HERIT  
NATIONAL TRUST; BURRA CHARTER; INTE  
TIONAL COUNCIL OF MONUMENTS AND SI  
VENICE CHARTER; INDUSTRIAL ARCHAEOLOGY

000000853840

TI On the recording of industrial artefacts  
AU MILNER=P  
AULOC University of Melbourne  
SOURCE The Protection of the Engineering Heritage. Bris  
9-12 May 1982 Preprints of Papers. p 24-28  
IMPRINT Barton: IEAust, 1982  
COLLATION 5 p ill. 9 refs  
SERIES National Conference Publication (IEAust) no 82  
AB The rational design of a system for the recordi  
industrial artefacts in the field and subsequent  
acquisition, is described with reference to the sy  
used within the Department of Mechanical Engine  
at the University of Melbourne.  
DE ENGINEERING - history  
MINOR INFORMATION RETRIEVAL SYSTEMS  
ID ENGINEERING HERITAGE; INDUSTRIAL ARCI  
OLOGY; UNIVERSITY OF MELBOURNE, DEPT  
MENT OF MECHANICAL ENGINEERING;



past, in order the better to tackle the problems of today and the future. It is on this historical significance of the engineering heritage that I would like to focus attention. For not only is the surviving heritage the physical evidence of past engineering achievements, it also helps to elucidate the history of engineering, and increases its interpretive power in our understanding of what our society is and where it is going.		SERIES	National Conference Publication (IEAust) no 80/2
DE	ENGINEERING - history	DE	ENGINEERING - history
<b>000000851108</b>		<b>000000851105</b>	
TI	The Australian heritage engineering record and the South Australian register	TI	Rescuing our engineering heritage
AU	ST. CLAIR-JOHNSON=C	AU	WHITMORE=RL
SOURCE	Engineering Conference 1980.: Engineering in the 80's. Adelaide, April 14-18, 1980. Supplement. p 9-15.	SOURCE	Transactions of The Institution of Engineers, Australia: General Engineering. v GE 4, 1980. p 16-19.
IMPRINT	Barton: IEAust, 1980	IMPRINT	Barton: IEAust, 1980
SERIES	National Conference Publication (IEAust) no 80/2	DE	ENGINEERING - history
DE	ENGINEERING - history	<b>000000850003</b>	
<b>000000851107</b>		TI	One hundred years of engineering in Victoria 1834 - 1934: Engineering heritage
TI	Concerning our engineering heritage	AU	EAST=LR
AU	BOURKE=M	IMPRINT	Sydney: IEAust, 1934
SOURCE	Queensland Division Technical Papers. v 21, n 19, August 1980. p 7-10.	COLLATION	(68)p III
IMPRINT	Brisbane: IEAust Queensland Division 1980	AB	Reprinted from The Journal of The Institution of Engineers Australia v 6 1934 Incorporating Transactions of The Institution v xv and distributed at the Second National Conference of Engineering Heritage. Melbourne 20-22 May 1985. National Conference Publication (IEAust) no 85/3
DE	ENGINEERING - history	DE	ENGINEERING - Victoria
<b>000000851106</b>		MINOR	ENGINEERING EDUCATION; BRIDGES; ROADS AND STREETS; RAILROAD PLANT AND STRUCTURES; RAILROAD ROLLING STOCK; PORTS AND HARBORS; AIR TRANSPORTATION; WATER SUPPLY; SEWERS; SEWAGE TREATMENT PLANTS; IRRIGATION; GAS INDUSTRY; ELECTRIC POWER SYSTEMS; TELECOMMUNICATION SYSTEMS; INDUSTRIAL ENGINEERING; MINES AND MINING TRAMWAYS; HISTORY; HARBOURS
TI	The evaluation of engineering heritage	ID	
AU	WHITMORE=RL		
SOURCE	Engineering Conference 1980: Engineering in the 80's. Adelaide, April 14-18, 1980. p 1-6.		
IMPRINT	Barton: IEAust, 1980		

# SUMMARY INDEX

Some terms are not included in SHE (Subject I) a general guide. .

## 1. GENERALIST INDEX

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Hargrave, L., N.S.W. ....
Jones, L.J.R., N.S.W. ....
Sandford, William, N.S.W. ....
Stephenson, Robert, U.K. ....
Telford, Thomas, U.K. ....
Wright, Benjamin, U.S.A. ....

### 1.2 General

#### A

Adelaide, engineering and industry, a tour .....
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Aeronautical Research Laboratories, history ....
Aerospace Industry .....
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Agricultural engineering, grain harvesting .....
Agricultural engineering, Sunshine Model 'A' t
Agricultural engineering, researching farm ma
Agricultural engineering, the Furphy water ca
Agricultural engineering, the Ridley stripper ...
Aircraft, Australia's, first .....
Air transport facilities in remote areas .....
Archives—Canberra Division, history .....
Archives, Engineer's papers, University of Sydr
Archives, homopolar generator, ANU .....
Archives, Institution of Engineers Australia, Ca
Archives, Mount Morgan Gold Mine .....
Artefacts, conservation .....
Assessment and conservation engineering relics
Aussat, satellite communications .....
Australian Heritage Engineering Record .....